# DOCUMENT RESUME

ED 142 830 08 CE 012 183

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TITLE Education-Industry Exchange Program for Vocational Teacher Preparation. A Cooperative Exploration and Developmental Project.

INSTITUTION Arkansas State Board of Vocational Education, Little Rock.; University of Central Arkansas, Conway.

SPONS AGENCY Arkansas State Dept. of Education, Little Rock. Div. of Vocational, Technical and Adult Education.

PUB DATE Jan 77

NOTE 166p.; Appendixes may be marginally legible due to print quality

EDRS PRICE MF-$0.83 HC-$8.69 Plus Postage.

DESCRIPTORS Associate Degrees; Career Ladders; *Curriculum Development; Experimental Programs; Industrial Arts Teachers; Post Secondary Education; Program Descriptions; Program Design; Secondary Education; *Skilled Workers; *Teacher Education; *Teaching Skills; Trade and Industrial Education; *Trade and Industrial Teachers; Vocational Retraining

IDENTIFIERS Arkansas

ABSTRACT

The Education Industry Exchange Program was initiated (1) to provide nonvocational industrial arts teachers with industrial skill training to teach trade and industrial subjects (to be accomplished through a graduate education program in cooperation with industry), (2) to enable craftspersons and skilled workers who were interested in teaching vocational education an opportunity to gain teaching competencies, and (3) to develop training curriculums for both populations of participants. Two successive training models were developed for objective 1, but little success was experienced because of the expense and length of such a program and the lack of desire of industrial arts teachers to retrain. A training model developed for objective 2 was implemented through an associate degree program concept designed to include professional industrial education courses traditionally required for vocational teacher certification and pertinent general education subjects. Curriculum materials were developed in several vocational industrial subjects: Methods of instruction, lesson planning, organization and management, and evaluation of instruction. A complete course syllabus for each subject is appended. (BL)

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ED142830

# EDUCATION-INDUSTRY EXCHANGE PROGRAM FOR VOCATIONAL TEACHER PREPARATION

A COOPERATIVE EXPLORATION
AND
DEVELOPMENTAL PROJECT
BY
CARL R. MCENTIRE
AND
DR. V. N. HUKILL, COORDINATOR

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INDUSTRIAL EDUCATION DEPARTMENT
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CONWAY, ARKANSAS

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NATIONAL INSTITUTE OF EDUCATION

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ARKANSAS STATE BOARD FOR VOCATIONAL EDUCATION
LITTLE ROCK, ARKANSAS

JANUARY 1977

CE 012 183

## TABLE OF CONTENTS

Page

Preface . . . . . . . . . . iv

Acknowledgement . . . . . . . . . . v

Introduction . . . . . . . . . . 1

Objectives . . . . . . . . . . 1

Definition of Terms . . . . . . . . . . 3

Assumptions . . . . . . . . . . 4

Procedure and Findings . . . . . . . . . . 5

Group I Training Mode I . . . . . . . . . . 5

- Advisory Committee . . . . . . . . . . 8
- Target Population . . . . . . . . . . 9
- Selection of Candidates . . . . . . . . . . 10
- Candidates Needs . . . . . . . . . . 11
- Industrial Site . . . . . . . . . . 12
- Group I Training Mode 3 . . . . . . . . . . 13
- Evaluation . . . . . . . . . . 13

Group II Training Mode 2 . . . . . . . . . . 15

- Assessment of Candidates Needs . . . . . . . . . . 16
- Design of Instructional Program . . . . . . . . . . 16
- Gaining Institutional Approval . . . . . . . . . . 18
- Assessment of Technical and Professional Competencies of the Candidates . . . . . . . . . . 19
- Selection of the Instructional Sites . . . . . . . . . . 19
- Evaluation . . . . . . . . . . 20

Summary . . . . . . . . . . 21

Conclusion and Recommendations . . . . . . . . . . 23

# APPENDIX

A Review of Related Literature
B First Letter of Invitation
C Second Letter of Invitation and Survey
D Third Letter of Invitation and Appointment
E Cooperative Training Agreement
F Proposal for Associate Degree
G Syllabus I Methods
H Syllabus II Lesson Planning
I Syllabus III Organization and Management
J Syllabus IV Evaluation

# PREFACE

From the passage of the Smith-Hughes Vocational Education Act in 1917 until the present, Trade and Industrial teachers have been hired from the ranks of craftpersons and skilled workers with subsequent in-service training sufficient to meet minimal certification requirements. This practice has produced neither sufficient quantity nor quality of Trade and Industrial teachers to meet the demands of Vocational Education in the state of Arkansas.

After the passage of the 1963 Vocational Educational Education Act and subsequent amendments, Vocational Trade and Industrial programs have proliferated, thereby compounding the problem.

The Education-Industry Exchange Program was an attempt to explore two specific training modes for preparing Trade and Industrial teachers. Mode I was directed toward providing non-vocational qualified teachers with a basic skill through a cooperative program with industry. Mode II was directed toward providing craftpersons and skilled workers with training in Instructional Technology. The efforts expended toward the accomplishment of this program resulted in the development of a career ladder approach to preparing Trade and Industrial teachers and the Associate Degree in Industrial Education proposed by Mr. McEntire is the first rung upon this career ladder. This Associate Degree also contains current certification requirements and provisions for subsequent articulation into a baccalaureate program if desired by the student. I believe this to be the most pedagogically sound approach, and in keeping with existing programs in other service areas

Mr McEntire has done a tremendous job in synthesizing the material, courses, etc., and we are indebted to the State Department of Vocational Education for their financial support and leadership exerted during the process of its development

Dr. V N. Hukill  
Chairman, Industrial Education Department.

# ACKNOWLEDGEMENT

This project was supported by the Division of Vocational-Technical and Adult Education, Arkansas State Department of Education and funded under the provisions of Part C of Public Law 90-576, The Vocational Educational Amendment Act of 1968.

Dr. Jack Nichols, Director of the Arkansas Research Coordinating Unit was the Coordinator at the State level and Dr. V. N. Hukill, Chairman of the Department of Industrial Education, of Central Arkansas was the Project Coordinator at the University level.

The review panel consisted of Mr. Grady Knight, Coordinator and Ms. Peggy Patrick, Program Analyst from the Department of Program Planning Evaluation, Research and Exemplary Programs; Mr. Charles Easley, Supervisor and Mr. Hugh Cheek, Assistant Supervisor from the Department of Trade and Industrial Education; and Mr. Jake Ruppert, Coordinator of Area Vocational Schools from the Division of Vocational Technical and Adult Education, Arkansas State Department of Education.

There were a host of others who were instrumental as consultants, advisors and kibitzers. Some of these were: Mr. Ernest Rush, Director of Vocational Education Little Rock, Arkansas Public Schools; Mr. Ed Hogan, Director of Vocational Education, Pulaski County Public Schools; Mr. Larry Hale, Director of the Foothills Vocational Technical School, Searcy, Arkansas; Mr. Thurston Kirk, Director of the Petit Jean Vocational Technical School, Morrilton, Arkansas; Mr. Fay Pew, Director of the Conway High School Area Vocational Center, Conway, Arkansas; Dr. Ben Vineyard, Chairman of the Department of Vocational Technical Education, Kansas State College of Pittsburg, Pittsburg, Kansas; Mr. John Lee, Personnel Director of Virco Manufacturing Company, Conway, Arkansas; Dr. Vincent Feck, Coordinator, Vocational Teacher Education, The University of Central Arkansas who assisted with the final report; and all of the Supervisors and Instructors of Trade and Industrial Edcation who attended the Education Industry Exchange Program course offerings.

Special recognition goes to the four secretaries who have typed and retyped the reports, letters, surveys, etc.. They were Miss Susie Archer, Mrs. Sondra Lace, Miss Mary Pearce, and Ms. Barbara Nichols

The entire work is dedicated to my daughter Teri Gail, who patiently put-up with me and corrected my grammar and composition

Carl R. McEntire
Conway, Arkansas
January 1977

## INTRODUCTION

The rapid expansion of Trade and Technical Programs in the state of Arkansas has created major problems The wide variety of these programs, ranging from basic auto-mechanics to advanced electronics, has precluded teacher educational institutions from providing adequately pre-service or in-service Teacher Training Programs in all the specialized skills that are needed. Skilled workers who possess only a secondary education, with little or no instructional expertise, are usually hired to teach specialized Trade and Industrial courses.

Their fundamental understanding of Instructional Technology is limited. Consequently, their effectiveness in communicating their knowledge and skills to the learner is also limited.

Clearly there was a need to explore alternative programs for preparing Vocational Industrial Teachers.

Presented in the following report are the findings of a study in which both exploratory and developmental activities were conducted, by the Industrial Education Department of the University of Central Arkansas, in an attempt to determine:

1. Whether or not persons, who have earned a teaching degree but lacked proficiency in a specialized trade area, could be trained through a graduate cooperative program, between a state institution of higher learning and a specific industry, sufficiently to become a certified teacher in a specific Trade and Industrial subject area.
2. Whether or not craftpersons and skilled workers could be taught teaching competencies in a Vocational Industrial Education program at an institution of higher learning, sufficiently to enable them to improve the learning efficiency in their Trade and Industrial classes
3. Whether or not the University of Central Arkansas could, by directing efforts toward objectives one and two above, develop an effective model which other institutions of higher education could use in developing additional Vocational Industrial Teacher Preparation Programs

### Objective

The ultimate objective of this project was to explore ways of providing the people of Arkansas with more and better Vocational Industrial Education. The immediate objectives of the project were:

1. To provide Non Vocational Industrial Arts teachers with industry skill training through a graduate cooperative education program in order to become proficient in specialized areas of Vocational Trade and Industrial Education.
2. To enable craftpersons and skilled workers, interested in teaching Vocational Trade and Industrial subjects, to gain teaching competencies through an undergraduate program designed specifically to meet individual participants needs.
3. To develop training curriculums for both populations of participants to be served and to make these curriculums available to other institutions of higher education.

# DEFINITIONS OF TERMS USED

*Vocational Industrial Education*: The Pre-Service and In-Service Educational Program conducted by an institution of higher learning for the purpose of preparing and up-grading Trade and Industrial Teachers.

*Trade and Industrial Teacher*: Those who teach Trade and Industrial subjects.

*Trade and Industrial Subjects*: Those courses which are designed to teach the learner the basic manipulative skills, safety practices, judgements, technical knowledge, and related occupational information for the purpose of fitting persons for initial employment in industrial occupations and those courses designed to up-grade and retrain workers employed in industry.

*Vocational Industrial Teacher Educators*: Those who prepare teachers of Trade and Industrial subjects.

*Vocational Industrial Subjects*: Those courses which are designed to prepare Trade and Industrial Teachers to teach Trade and Industrial subjects.

All terminology used in this report are compatible with and conform to the following publications:

1. *Standard Terminology for Curriculum and Instruction in Local and State School Systems*, Putnam, John F. and Chismore, W. Dale, U. S. Department of Health Education and Welfare, Washington, D. C., 1970.
2. *Vocational-Technical Terminology*, Publications Committee, American Vocational Association, Washington, D. C., 1971.
3. *Dictionary of Education*, Good, Carter V., and Merkel, Winifred R., Assistant Editor, McGraw-Hill, 34th ed., New York, New York, 1973.

## Assumptions

The following assumptions were set forth for this project:

### Group I

Assumption 1. There are many teachers of Industrial Arts who are interested in becoming qualified to teach Trade and Industrial subjects.

Assumption 2. Industry will cooperate in a training program which would provide teachers of Industrial Arts an opportunity to develop a trade skill sufficient for them to become qualified to teach Trade and Industrial subjects.

### Group II

Assumption 3. Craftpersons and skilled workers who are currently employed to teach Trade and Industrial subjects need additional training in Instructional Technology.

Assumption 4 Craftpersons and skilled workers who are currently employed in industry should be interested in training toward becoming certified teachers of Trade and Industrial subjects.

### General

Assumption 5. If assumptions 1 4 are correct, then an on-going instructional program should be designed and initiated by institutions of higher learning.

Assumption 6. The University of Central Arkansas could exercise sufficient flexibility to enable the development and initiation of such a program which would allow undergraduate or graduate credit toward a degree in Vocational Industrial Teacher Education.

## PROCEDURE AND FINDINGS

The exploratory and developmental functions of this program are emphasized by the phrasology which was used in the initial proposal of the project: "A considerable amount of preliminary field work will be necessary to determine the feasibility of the program and *alternative* procedures needed for the implementation of its various components . . . Since the program is innovative, a high degree of program flexibility will be included to augment or replace college or university teaching strategies currently used."

The rationale of the Education-Industry Exchange Program embodied the idea that, "If the Trade and Industrial Education Teacher Corps could be increased in numbers and up-graded in quality", then both quantity and quality of Vocational-Technical and Adult Education available to the people of Arkansas could also be increased.

The Education-Industry Exchange Program was designed to explore two specific modes of preparing Trade and Industrial teachers If either or both of those two modes were successful then the objective of providing more and better Trade and Industrial Education to the people of Arkansas could also be attained.

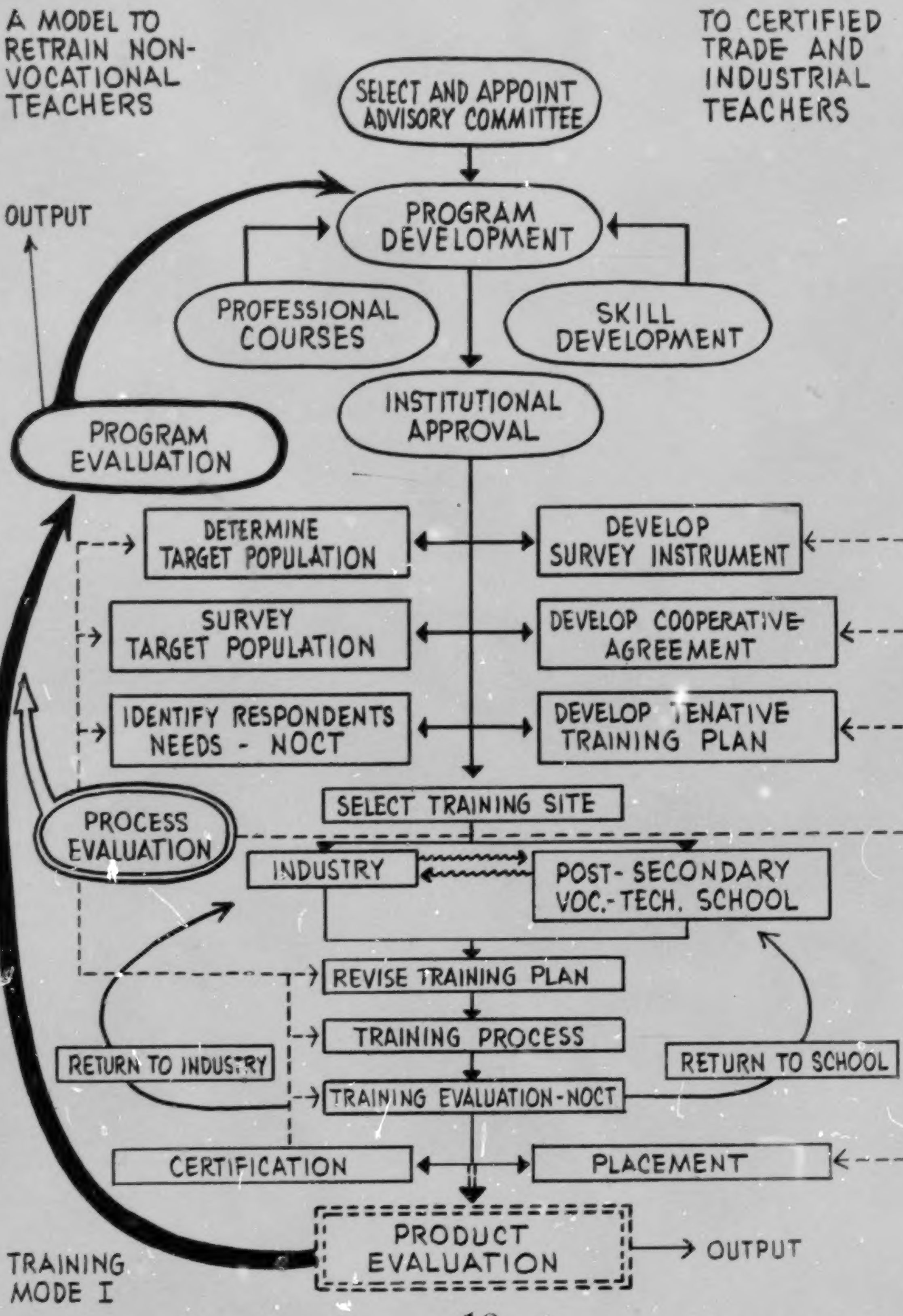
The first mode was designed for persons who had developed teaching expertise as Industrial Arts Teachers in non vocational subjects but did not possess a specific trade skill. The persons to be developed by the use of this mode of traning were identified as "Group I". Figure I illustrates a model for retraining non-vocational teachers to certified Trade and Industrial teachers.

The second mode was designed for craftpersons and skilled workers who had previously developed a trade skill, including industrial experience, but possessed little or no teaching expertise. The persons to be trained using this mode were identified as Group II. Figure 2 illustrates a model to initiate and manage a pre service/in service Trade and Industrial Teacher Preparation Program.

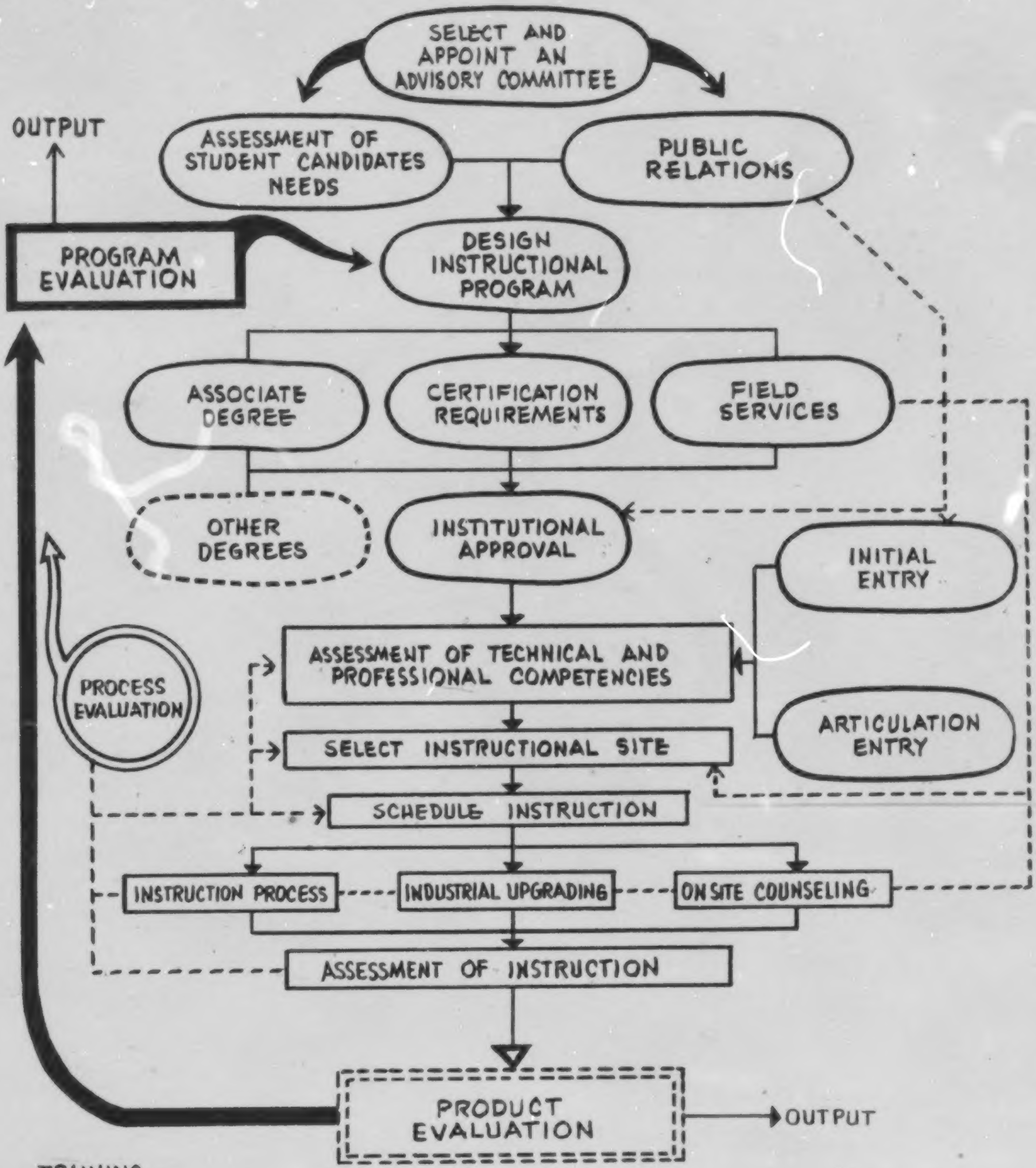
The Education Industry Exchange Program can be explained and understood best by separating the two distinct functions of the program. Those activities which were carried out for accomplishing the objectives of Group I will be explained first then those activities which were carried out for Group II will be explained second

### Group I Training Mode I

Activity for this group was concentrated around the exploration of possible practices and procedures necessary to locate and match candidates to a specific trade, industry, and industrial site.


A MODEL TO RETRAIN NON-VOCATIONAL TEACHERS
TO CERTIFIED TRADE AND INDUSTRIAL TEACHERS
SELECT AND APPOINT ADVISORY COMMITTEE
OUTPUT
PROGRAM DEVELOPMENT
PROFESSIONAL COURSES
SKILL DEVELOPMENT
INSTITUTIONAL APPROVAL
PROGRAM EVALUATION
DETERMINE TARGET POPULATION
DEVELOP SURVEY INSTRUMENT
SURVEY TARGET POPULATION
DEVELOP COOPERATIVE AGREEMENT
IDENTIFY RESPONDENTS NEEDS - NOCT
DEVELOP TENATIVE TRAINING PLAN
SELECT TRAINING SITE
PROCESS EVALUATION
INDUSTRY
POST-SECONDARY VOC.-TECH. SCHOOL
REVISE TRAINING PLAN
TRAINING PROCESS
RETURN TO INDUSTRY
RETURN TO SCHOOL
TRAINING EVALUATION-NOCT
CERTIFICATION
PLACEMENT
PRODUCT EVALUATION
OUTPUT
TRAINING MODE I

A MODEL TO INITIATE AND MANAGE A PRE-SERVICE AND IN-SERVICE TRADE AND INDUSTRIAL TEACHER PREPARATION PROGRAM


SELECT AND APPOINT AN ADVISORY COMMITTEE
OUTPUT
ASSESSMENT OF STUDENT CANDIDATES NEEDS
PUBLIC RELATIONS
PROGRAM EVALUATION
DESIGN INSTRUCTIONAL PROGRAM
ASSOCIATE DEGREE
CERTIFICATION REQUIREMENTS
FIELD SERVICES
OTHER DEGREES
INSTITUTIONAL APPROVAL
INITIAL ENTRY
ASSESSMENT OF TECHNICAL AND PROFESSIONAL COMPETENCIES
PROCESS EVALUATION
ARTICULATION ENTRY
SELECT INSTRUCTIONAL SITE
SCHEDULE INSTRUCTION
INSTRUCTION PROCESS
INDUSTRIAL UPGRADING
ONSITE COUNSELING
ASSESSMENT OF INSTRUCTION
PRODUCT EVALUATION
OUTPUT

TRAINING MODE 2

FIGURE 2

Ten candidates were to be selected from a target population of one hundred forty-one teachers of Industrial Arts who had obtained a baccalaureate degree from the University of Central Arkansas since 1965 The choice of trade area, indsutry and industrial site was to remain with the candidate, providing that the site was within the boundaries of the state of Arkansas.

As indicated on the model for retraining non-vocational teachers to certified Trade and Industrial Teachers, (figure 1), exploration encompassed the following generalized functions:

1 Select and appoint an advisory committee
2 Program Development
3 Determine target population
4. Survey target population
5 Identify respondents needs
6 Select industrial site
7 The training process
8 Certification
9 Placement
10 Evaluation

Each of these functions required other specific activites, some of which were in progress before, during, and after the main function on the model. These functions and activities are detailed as follow:

### Advisory Committee

A rather informal advisory committee was utilized throughout the life of the project. Educators from the University of Central Arkansas, State Area Vocational Technical School Administrators and Teachers, Secondary School Administrators and Teachers, Industry, Management, and Labor were consulted many times concerning the various problems encountered in effecting the function of the Education Industry Exchange Program. A project review panel consisted of the project staff and personnel from the State Department of Education, Division of Vocational, Technical and Adult Education

Development of a formalized program of instruction beyond the current position will require a more formalized advisory committee

### Program Development

A specific Training Syllabus for Group I was not developed due to inadequate participation from the target population

## Professional Courses

Although Group I activity did not progress far enough to varify the professional course offering, it was anticipated that the existing senior and graduate level courses at the University of Central Arkansas would be adequate to meet the minimum Trade and Industrial Teacher Certification requirements.

These courses were:

1 Industrial Education 5301, Principles of Trade and Industrial Teaching

2 Industrial Education 5300, Independent Study Series

3 Industrial Education 6330, Development of Industrial Education, A History and Philosophy of Industrial Education.

4 Industrial Education 6300, Curricular materials and methods of Instruction Series.

## Technical Skills

The determination of technical skills was to be accomplished by the Director through the use of an interview with the candidate and by reviewing docomentary evidence of the candidates post training and experiences

A pre testing program should be used to determine technical competencies.

A topical training outline was to be deveolped indicating the areas of training required by the candidate to become competent in a specified skill. This outline was to be revised during contract negotiations with industry to assure compatibility with the capabilities of the training station.

After entering training, the candidates were to meet with the Director once each month to discuss their problems, concerns and interests Later the Director would discuss these issues, if appropriate, with the Owner/Manager of each training station.

The development of a topical training outline and the group discussions were not completed when participants could not be obtained

## Target Population

The Education Industry Exchange Program was originally conceived with graduates from the Industrial Education Department of the University of Central Arkansas as constituting the potential target population

Since only five to ten candidates were desired, it was decided that only Industrial Art majors who had graduated from the Industrial Education Program at the University of Central Arkansas since 1965, would be solicited for candidacy into the Education Industry Exchange Program.

The Departmental records yielded the names of one hundred forty-one persons. Current addresses were checked with the campus Alumni Association records.

### Seclection of Candidates

A brief letter of invitation to participate was devised and sent to the identified target population (Appendix B) Each of those identified persons was sent the letter of invitation on September 18, 1975 Thirteen replies were received by the middle of November 1975, for a return of 9.22% of the Target Population. Each of these respondents expressed a negative interest in the proposed program because of one of the following reasons: (1) already have a Masters Degree; (2) already certified as a Trade and Industrial Teacher; and (3) no longer involved in education. This low rate of return was a surprise since it was assumed that a considerable number of these people would be interested in such an endeavor. At one time or another many of those identified as part of the Target Population had expressed an interest in such an endeavor to State Department Supervisory Personnel or to the Chairman of the Industrial Education Department, the University of Central Arkansas.

A new questionaire was devised in an attempt to determine the specific reasons for what appeared to be a lack of interest (Appendix C)

The thirteen respondents, who expressed a negative interest in the program, and the names of those persons on the original letters of invitation which were undeliverable, for various reasons, were removed from the survey mailing list leaving one hundred eighteen names or 84% of the original Target Population remaining as potential candidates. On December 3, 1975, each of these persons were sent a copy of the second survey instrument.

It was determined, from responses to the survey, that the lack of response to the initial single purpose letter of invitation was probably due to the timing. In mid-September schools were commencing a new term and most of the persons in the Target Population were already committed for another year on their current contracts; therefore, they simply did not respond to the invitation.

The final response at the end of January 1976, was sixty replies for a return of 42.55% of the Target Population. Fifty three or 88 33% of these respondents were eliminated from the potential candidate list for the following reasons:

1 Already have masters degree
2 Already certified as a Trade and Industrial teacher
3 No longer involved in Education
4 Already possess a certifiable skill. (Table 1)

A third letter, detailing the Education Industry Exchange Program, was devised to include a blank form for requesting a personal interview. (Appendix D)

On February 5, 1976, this third letter was sent to the seven potential candidates and to those respondents who had requested additional information. One respondent requested an interview. On February 27, 1976 one person from Paragould, Arkansas, was interviewed as a possible candidate for Group I of the Education Industry Exchange Program.

Table 1

Results of Survey of Group I Population

N = 141

| Items | | Number | Percentages |
|---|---|---|---|
| 1. | Surveyed | 141 | 100 |
| 2 | Not Located | 10 | 7.9 |
| 3 | Contacted | 131 | 92.9 |
| 4 | Respondents | 60 | 42.5 |
| 5 | No Longer Involved in Education | 21 | 14.9 |
| 6. | Already Posses M. S. Degree | 15 | 10.6* |
| 7 | Already Possess Certifiable Skill | 13 | 9.2 |
| 8 | Already Certified T & I Teacher | 9 | 6.4* |
| 7 | Already Possess M. S. Degree and are Certified T & I Teachers | 5 | 3.6* |
| 8. | Prefer to Remain I. A. Teachers | 2 | 1.4 |
| 9 | Potential Candidates for Group I | 5 | 3.6 |

*Categories Not Mutally Exclusive

This one respondent represents only .71% of the original target population of one hundred forty one

**Candidates Needs**

The candidates needs were determined in an interview by the Director of the Education Industry Exchange Program. During the interview with the candidate, it was found that he had graduated from the Industrial Arts Program at the University of Central Arkansas in the Spring of 1974 He possessed some experience in Power Mechanics; sufficient to warrant his choice of skill development in automobile mechanics He chose Malvern, Arkansas as the geographical site for his training Financial, personal, and family considerations were involved in the choice of this location and precluded the choice of any other geographical site.

## Industrial Site

A cooperative training agreement between the Trainee, Training Industry, and the University of Central Arkansas was prepared. (Appendix E) Search was started to identify a suitable location in the Malvern area to conduct the training for the candidate. The search involved:

1. The Malvern Chamber of Commerce
2. The Arkansas Employment Security Office at Malvern
3. Selected business in the automobile repair and maintenance industry.

### 1. Chamber of Commerce

The Manager of the Malvern Chamber of Commerce provided extensive background information on the various automotive industries in the area. This information aided in the selection of potential training stations.

### 2. Arkansas Employment Security Division

An employee of the Arkansas Employment Security Division at Malvern substantiated the background information which had been provided by the manager of the Malvern Chamber of Commerce. In addition he added that certain federal funds were temporarily available to industry for partial reimbursement of the candidate's salary and for the instructor of such training.

### 3a. Automobile Dealership

The Chevrolet Oldsmobile Dealership was the first choice for the training site. This facility was new and well equipped and had a reputation for having an aggressive on-going training program for the employees. The owner and operator, was contacted for an appointment so that the Director of the Education Industry Exchange Program could explain the program. Because of conflicting schedules the appointment could not be consummated until April 1, 1976. The owner expressed a deep interest in Vocational Education but stated that because of the current existing economic "slump", there did not appear to be sufficient potential in the program for either immediate nor long range economic gain for his company. He, therefore, declined the invitation to participate in the Education Industry Exchange Program.

The owner, however, did make the suggestion that "These people (the Target Population for Group I) should be returned to the State Area Vocational Technical Schools for their basic skill development and then into industry for experience". This suggestion was echoed later by other industrial management people

The Ford Motor Company Dealership was the second choice for the training site for the candidate. The owner/operator also expressed a concern for Vocational Education. He stated that the local State Area Vocational Technical School was doing a fine job and that he presently had three new employees which had recently graduated from that facility. He echoed the previous comments expressed about the current "economic slump" as he declined the invitation to participate in the Education Industry Exchange Program

**3b. Independent Garages**

Owners of two independent garages were contacted Both of the owners expressed a feeling that their operations would not lent themselves toward accomplishing the objectives of the project and therefore declined an invitation to participate

Various businesses in Little Rock and Conway were later canvassed in an effort to determine if these attitudes prevailed in other industries and geographical locations as well. In one form or another the previously stated attitudes toward the "economic slump" were substantiated.

One year of the life of the program had elapsed without real progress having been made with Group I. Consultation with the review panel and other advisory groups resulted in a decision to devise Training Mode 3 for Group I. (Figure 3)

### Group I

### Training Mode 3

Training Mode 3 consisted of placing a Group I type person, who possessed some basic skill, into a position as a teachers aide in an on-going Vocational Trade and Industrial Program. (Figure 3)

As previously experienced, difficulty was encountered in locating an interested graduate of the Industrial Arts Program; consequently, a sophomore in the Industrial Arts Program at the University of Central Arkansas, who was interested in the Education-Industry Exchange Program, was selected for this exploration.

In August 1976, this student was placed as a teachers aide to the General Building Trade Instructor in the Conway Area Vocational Center, Conway High School. After four (4) months experience, it appears that in this case the candidate has developed into an excellent teachers aide The opinions of the Director, the candidate and the vocational instructor involved are mixed as to whether or not this mode of training will be adequate to develop basic skills sufficiently to meet the Trade and Industrial Teacher Certification requirements Complete evaluation of the one case is not expected to be available until after July 1, 1977.

### Evaluation

### Process Evaluation Training Mode 1

Process evaluation of this training mode was to be accomplished through the use of progress reports from the on site trainer, multiple monitoring, direct interviews with trainer and trainee, and

A MODEL FOR PREPARING PARTIALLY QUALIFIED NON-VOCATIONAL TEACHERS TO CERTIFIABLE TRADE AND INDUSTRIAL TEACHERS.

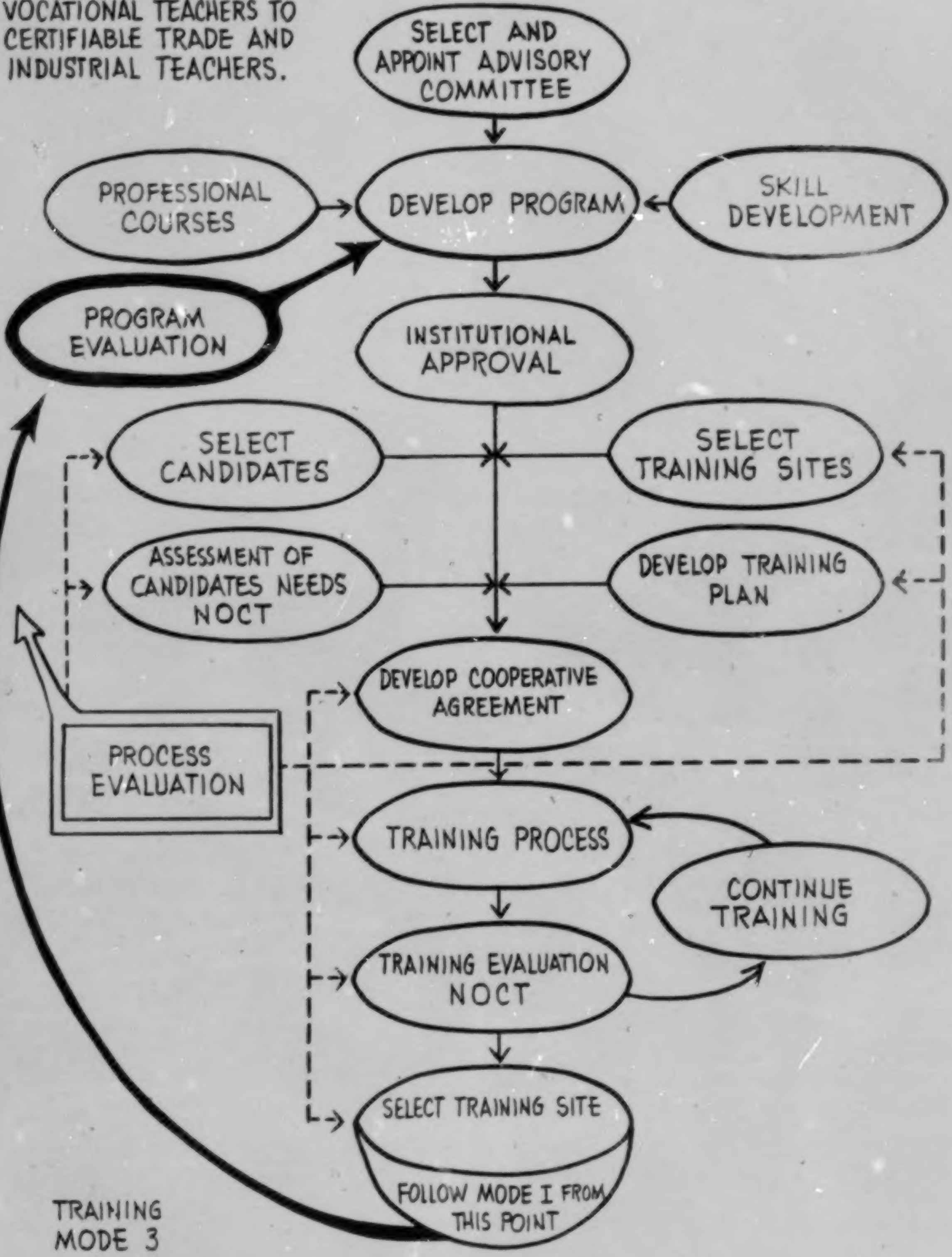

SELECT AND APPOINT ADVISORY COMMITTEE
PROFESSIONAL COURSES
DEVELOP PROGRAM
SKILL DEVELOPMENT
PROGRAM EVALUATION
INSTITUTIONAL APPROVAL
SELECT CANDIDATES
SELECT TRAINING SITES
ASSESSMENT OF CANDIDATES NEEDS NOCT
DEVELOP TRAINING PLAN
DEVELOP COOPERATIVE AGREEMENT
PROCESS EVALUATION
TRAINING PROCESS
CONTINUE TRAINING
TRAINING EVALUATION NOCT
SELECT TRAINING SITE
FOLLOW MODE I FROM THIS POINT
TRAINING MODE 3

FIGURE 3

JANUARY 1977

limited observation of the trainee at the training site. Dr Jack Nichols, the Project Coordinator at the State Level and Dr. V N Hukill, the Project Coordinator at the University level, were to monitor each step of the process throughout the life of Training Mode 1

### Process Evaluation Training Mode 3

Process evaluation of this training mode was to be basically the same as the one for training mode 1

The specific training outline for the candidate was to follow the regular high school afternoon class schedule for a period of one year

The assessment of the candidates needs should have been determined through the use of the applicable National Occupational Competency Test. The same test should also be used to measure training achievement at the end of the training period

Post training scores have not been normed but it is generally accepted that a score at the 50th percentile should be the minimum acceptable for certification in the state of Arkansas.

### Program Evaluation

The review panel reviewed the program periodically and made adjustments in approach and finally changed the program to Training Mode 3.

### Group II

### Training Mode 2

The activities generated for this group concentrated around the development of a program of instruction which would provide an opportunity for Trade and Industrial Teachers to develop their expertise in teaching their trade skills to Vocational Industrial students.

Five to ten candidates were to be selected from Trade and Industrial Teachers who:

1 Resided within driving distance of the University of Central Arkansas campus.

2 Were craftpersons with two or more years of experience beyond the learner level in their trade area

3 Were certified Trade and Industrial Teachers and currently employed to teach a trade subject in either the public or state school systems.

As indicated on the model for initiating and managing a pre-service and in-service Trade and Industrial Teacher Preparation Program, (figure 2) Mode 2 development activities encompassed the following generalized functions:

1 Assessment of candidates needs

2 Design of the instructional program

3 Gaining institutional approval

4. Assessment of technical and professional competencies of the candidates

5 Selection of instructional sites

6 Evaluation

Each of these functions required other specific activities. Some of which were in progress before, during, and after the main function as indicated on the model. These functions and activities are detailed as follows:

**Assessment of Candidates Needs**

The target population of this group was easily identified. It consisted of those teachers who were currently certified and employed to teach Trade and Industrial subjects in the public and State School systems A listing of these teachers was obtained from the State Department of Education, Division of Vocational Technical and Adult Education

Considerable field work in the form of workshops, discussion groups, conferences and research of related literature, was required to determine the instructional areas of greatest and most immediate need to Group II The result of this work indicated that Group II needed "relevant experiences" in the following generalized areas of Instructional Technology:

1 Methodology

2 Development of instruction (lesson planning)

3 Evaluation of learning

4 Organization, management and safety

5 Youth activities (Vocational Industrial Clubs of America)

6 Preparation and use of audio visual teaching aids

7 Occupational, job and instructional analysis

8 Group discussion and conference leadership

9 Vocational advisory committee formation and use

10 Vocational History and Philosophy

During the exploration of the candidates needs, it was found that there was considerable variance in individual needs, but it was commonly agreed that whatever kind of program that was put together, it should be: creditable, lend itself to the career ladder concept, recognize previously developed skills, encourage articulation from other accreditable educational institutions and allow college credit for up grading experiences in industry

**Design of Instructional Program**

Existing college credit courses were to be used when possible New courses were to be developed as necessary to complete a professional development program for Group II

There were three courses at the Unviersity which could be used with only minor content modification These courses had been developed for upper division or junior-senior level courses.

Academic policy required that students complete at least 60 semester hours of college credit at the lower division or freshman sopnomore level prior to enrolling in these existing courses. Most of those persons requiring course work possessed few if any college credits. Considerable effort was expended, with only minor success, in an attempt to mitigate this situation for Vocational Industrial students

After this experience, it seemed appropriate that some kind of vehicle must be designed, incorporating the previously mentioned ideas, so that institutional approval could be gained for a complete program.

After consultation with concerned State and University Educators, it was decided that an Associate Degree Program would be the most appropriate approach for the target population concerned

Professional courses in Instructional Technology, which had traditionally been required for Trade and Industrial Teacher Certification, were combined with complimentary general education courses to make up the Associate Degree Program Proposal. (Appendix F) This program if effected could attract a large portion of the target population as well as craftpersons and skilled workers in industry back into the mainstream of higher education; eventually providing more and better teachers of Trade and Industrial subjects

Four traditional Industrial Education courses which were also required for certification were selected and incorporated into the proposal. These were:

The first, a methods course, would provide a basic foundation in teaching methodologies and philosophies A course which would culminate with a video taped mini-practice teaching session. This technique would enable a Vocational Industrial Teacher Educator to critique the students on lesson planning, lesson presentation, and the evaluation of learning (Syllabus No. 1, Appendix G)

The second, a course in the development of instruction, would incorporate the various steps in planning specific lessons Upon the completion of this course, the learner should have a pilot model of his or her specific course of study Later, the learner could build a complete course of study for his or her specific trade area This course would cut across generalized professional subject areas sufficiently for the learner to be effective in lesson planning (Syllabus No. 2, Appendix H)

The third course would involve Organization, Management, and Safety in the school shop or laboratory It would include planning for a new shop or the remodeling of an existing facility to insure safety of the learner and instructional efficiency It would also include plans for initiating pupil personnel management and record keeping systems (Syllabus No 3, Appendix I)

The fourth course would dwell upon the techniques of measuring and evaluating learning in the cognitive, affective, and psychomotor learning domains. (Syllabus No 4, Appendix J)

The Associate Degree is only one rung in the career ladder for the Trade and Industrial teacher. The "Other Degree" block on the model for preparing pre service and in-service Trade and Industrial teachers allows for incorporating the baccalaureate and masters degrees at a later date. Those institutions already possessing the baccalaureate and masters degrees could initiate the associate degree as deemed necessary to complete the career ladder approach to Trade and Industrial Teacher preparation

## Gaining Institutional Approval

The process of gaining institutional approval of a Vocational Program in a traditional liberal arts academic atmosphere could be a long, tedious, and challenging experience. Some of the issues encountered at the University of Central Arkansas during this process were:

1. Gaining acceptance of the concept of credit for previous industrial experience and non-formal skill development.
2 Gaining acceptance of traditional Vocational Industrial Education courses as being equal to traditional academic subjects.
3 Gaining acceptance of credit for practice teaching by evaluating the instructor on the job The evaluation was to be accomplished only after the candidate had completed all other associate degree requirements and at least three (3) years of trade and Industrial teaching experience.
4 Gaining acceptance of the idea of completing professional courses prior to the completion of the basic general education requirements
5 Gaining acceptance of the associate degree as a part of a career ladder approach rather than a terminal degree

The Associate Degree Package was approved by the Undergraduate Council in April 1976.

The next step of approval was the Council of Deans which approved the proposal in July 1976.

The University of Central Arkansas Board of Trustees approved the proposed Associate Degree for Industrial Education on September 16, 1976

The next and final approving authority would be the "Arkansas State Board for Higher Education". Approval action is expected at the next meeting scheduled for early February 1977.

Further activity with Group II could not be scheduled until after approval of the Associate Degree program by the State Board of Higher Education This would place the next phase of activity into the first summer session 1977, which was beyond the time frame of the

Education Industry Exchange Program With this consideration in mind it was considered more economical and feasible to terminate the project. The current University of Central Arkansas staff from the Industrial Education Department and the Director for the Center for Vocational Education will continue development of University policies and procedures.

During the course of the above events, considerable coordination was effected with the Department of Continuing Education, the Dean of Undergraduate Studies, the Dean of Graduate Studies, and the College of Education on the University of Central Arkansas campus and the Division of Vocational, Technical and Adult Education, Arkansas Department of Education.

The continuing discussion about the concepts which were introduced by this proposal, indicates that the Education Industry Exchange Program had considerable impact upon the institution.

### Assessment of Technical and Professional Competencies of the Candidate

It was expected that the National Occupational Competency Test for a given Trade area would measure Technical Competencies satisfactorily

As yet no known standardized instrument has been developed which can adequately measure the professional competencies of Trade and Industrial teachers. Until such an instrument becomes available, it must be assumed that each teacher should satisfactorily complete a specified group of professional Industrial Education courses, such as those contained in the associate degree in Industrial Education, which was proposed as a result of activities of this project

### Selection of Instructional Sites

The selection of the instructional sites for the Education Industry Exchange Program was based upon availability of a sufficient number of the target population who desired upgrading and were within easy driving distance of a given site Three separate sites were chosen at which professional couses were to be offered:

1. On the University of Central Arkansas campus at Conway
2. At the Gateway State Vocational Technical School at Batesville, Arkansas
3. At the Central Baptist Hospital Education Building, the University of Central Arkansas Health Occupations Education Center in Little Rock

Industrial Education 4301/5301 Principles of Teaching Trade and Industrial subjects, a course in Instructional Technology, was offered at each of the three above sites The students attending each of these classes were slightly different

Site 1 on the University of Central Arkansas campus contained a mixed student population from both the staff of public secondary schools and the staff of post secondary State Vocational Technical schools

Site 2 at the Gateway Vocational Technical School in Batesville contained students from the staff of post secondary Vocational Technical Schools only.

Site 3 at Central Baptist Hospital in Little Rock contained students from the staff of the public secondary schools only

Future site selection should be on demand but coordinated very closely with the Supervisor of Trade and Industrial Education at the State Division of Vocational, Technical and Adult Education.

All professional classes offered during the normal school year should be scheduled in the evening after normal working hours Summer course schedule could vary from this concept as desired.

An interesting schedule was suggested but not confirmed by the activities of this project. Several Trade and Industrial Teachers suggested that class schedules could be concentrated in three separate weeks, for a total of 45 clock hours of course work, which would equal a three semester hour course The following is an example but could be varied as desired:

| | | | |
|---|---|---|---|
| Site A | M F | 6 9 pm | Week 1 |
| Site B | M F | 6 9 pm | Week 2 |
| Site C | M F | 6 9 pm | Week 3 |
| Site A | M F | 6 9 pm | Week 4 |
| Site B | M F | 6 9 pm | Week 5 |
| Site C | M F | 6 9 pm | Week 6 |
| Site A | M F | 6 9 pm | Week 7 |
| Site B | M F | 6 9 pm | Week 8 |
| Site C | M F | 6 9 pm | Week 9 |

Note: Each of the sites would contain a different population

## Evaluation

### Process Evaluation Training Mode 2

Process evaluation of this training mode was to be accomplished through the use of progress reports from the Project Director Dr. Jack Nichols, the Project Coordinator at the State level and Dr V. N. Hukill, the Project Coordinator at the University level were to monitor each step of the process throughout the life of the project

### Training Evaluation

The training evaluation was to be accomplished through the use of normal course objective, and performance tests covering the subject matter of each specific course. At the end of each course offering, each student was to complete an evaluation of the course material and the presentation of that material. (Appendix K)

### Program Evaluation Training Mode 2

The review panel reviewed the progress of the project periodically and made appropriate suggestions and modification

## SUMMARY

In July of 1975, the Education Industry Exchange Program was initiated by the Department of Industrial Education at the University of Central Arkansas, Conway.

The Project had these objectives:

1 To provide non-vocational Industrial Arts teachers with industrial skill-training. This was to be achieved through a graduate cooperative education program, so they could become proficient in specialized areas of Vocational Trade and Industrial Education

2 To enable craftpersons and skilled workers who were interested in teacning Vocational Trade and Industrial subjects, an opportunity to gain teaching compentencies. This was to be achieved through an undergraduate program designed specifically to meet the individuals needs

3. To develop training curriculums for both populations of participants and to make these available to other institutions of higher education

### OBJECTIVE 1

A training model was developed and designated as training mode 1.

A letter of invitation to become a candidate for Industrial Skill Training was sent to one hundred forty one persons who had graduated from the, Industrial Arts Teacher Training Program at the University of Central Arkansas since 1965 who were selected as the Target Population for Group 1

A total of sixty persons responded to the invitation to becoming a candidate for the program The reasons for non participation as illustrated in Table 1 were:

1. 14.9% no longer in education
2. 10.6% already possess masters degree

3. 9.2% already possess certifiable skill.
4. 6.4% already certified Trade and Industrial teacher.
5. 1.4% prefer to remain Industrial Arts Teachers.
6 3.6% potential candidates

Only one person agreed to participate in the program.

No industrial firm, which met minimum requirements, could be found which was willing to participate as a training site for the one respondent. It appeared that the Education-Industry Exchange Program, as designed, could not provide financial rewards sufficient to entice industry into participation. Therefore, the training of the one respondent was not consumated.

After this experience a second training model was developed and designated training mode 3.

Training mode 3 provided for placing a Group I type person as a teachers aide in an on-going trade and industrial program.

No Industrial Arts graduate who was willing to participate in the program could be found. Consequently a sophomore who was majoring in Industrial Arts at the University of Central Arkansas, and was interested in the program, was placed as a teachers aide in an on-going General Building Trades Program in a secondary vocational program.

After four months experience with this one case, this mode of training does not seem to be an efficient method of developing basic skill sufficiently for a person to become a certifiable Trade and Industrial Teacher.

## OBJECTIVE 2

A training model was developed and designated Training Mode 2.

Teachers of Trade and Industrial subjects who were currently employed in either a public secondary or state post secondary vocational program and who were located within a reasonable driving distance of the University of Central Arkansas campus, were selected as the target population for Group II.

Several workshops were conducted, in cooperation with the Division of Vocational Technical and Adult Education, State Department of Education, so that the needs of this group could be assessed.

Existing Industrial Education courses which had been designed as upper level junior-senior courses were offered, with minor content modification.

Academic policy required that a student must have completed at least sixty semester hours of course work with a grade point average of 2.0 or better before being permitted to enroll in upper division courses.

Forty-two students at three separate locations enrolled for the courses.

Site 1 was on the University of Central Arkansas campus. The student body consisted of instructors from the staffs of both public secondary and post-secondary State Vocational Technical Schools.

Site 2 was a Gateway Vocational Technical School, Batesville. The student body consisted of instructors from the staffs of post secondary State Vocational Technical Schools only.

Site 3 was at the University of Central Arkansas Extension Center in the Education Building of Central Baptist Hospital at Little Rock. The student body consisted of instructors from the staffs of public secondary schools only.

Most of the above students possessed little or no college credits therefore were not allowed to continue enrolling in the existing upper division courses. Considerable effort was expended, with only minor success, in an attempt to mitigate this situation for these students.

## OBJECTIVE 3

After the previously mentioned experience it was decided that an associate degree would be the most appropriate undergraduate program for Trade and Industrial Teacher Preparation. A proposal was designed to include Professional Industrial Education courses which have been traditionally required for Vocational Teacher Certification, and pertinent general education subjects.

The proposal has been approved through the University of Central Arkansas system and is presently awaiting approval from the Arkansas Board for Higher Education. Approval action is expected to occur at the next scheduled meeting of the Board early in February 1977.

Upon approval, this program shall be effected by the currently existing staff of the Department of Industrial Education at the University of Central Arkansas.

## CONCLUSIONS AND RECOMMENDATIONS

In accordance with the stated purpose of this project to explore various ways to prepare Trade and Industrial Teachers in the state of Arkansas, the following conclusions were made:

**Group I**

1. There were very few graduates from the Industrial Arts program at the University of Central Arkansas who desire to retrain to become certifiable Trade and Industrial teachers.

2. There is an insignificant number of those who desire retraining who are willing to do so without positive assurance that their financial status will be measurably improved immediately.

3. The Education Industry Exchange Program did not offer industry sufficient assurance of either short or long range financial rewards to entice them to participate during the currently existing economic slump.

4. In the one case involved in this project, there are strong indications that the placement of Industrial Arts majors as Teachers Aides in an on going Trade and Industrial Program is, at best, a questionable mode of cross training non vocational teachers to teach Trade and Industrial subjects in a Vocational Technical Program.

5. The retraining of qualified non vocational Industrial Arts teachers to certifiable Trade and Industrial teachers would probably require that basic skill development be accomplished at a state Vocational Technical school with subsequent Industrial experience prior to placement on the job as a teacher.

6. The retraining of qualified non vocational teachers to certifiable Trade and Industrial teachers could be lengthy and expensive.

### Group II

1. Craftpersons and skilled workers can be taught how to teach their trade skills to others through a program of study at an institution of higher learning.

2. There is a very great demand in the state of Arkansas for both pre-service and in-service training in Instructional Technology from both teachers of Trade and Industrial subjects and Administrators of Vocational Technical Programs.

3. The Associate Degree Program concept was highly acceptable by Trade and Industrial teachers in Arkansas. At this time it is probably the best vehicle for providing the first professional rung on the career ladder to Trade and Industrial teachers as well as providing initial certification requirements in Instructional Technology.

### General

1. The University of Central Arkansas has developed models for three modes of preparing Trade and Industrial teachers which other institutions of higher learning can utilize in preparing Trade and Industrial teachers.

2. Qualified vocationally trained graduates from the State Vocational Technical Schools appear to be the most readily available persons in appreciable quantity which can be trained in Instructional Technology quickly and economically. This training can occur either in a pre-service Vocational Industrial Teacher Preparation Program while the trainee is gaining experience in industry or in an in-service Vocational Industrial Preparation Program after being hired to teach their trade skill in the public or state school systems.

The recommendations derived from experience during this project are specifically applicable to the state of Arkansas and are as follows:

1 This study, although not definitive, has produced sufficient evidence to indicate that Trade and Industrial Teacher Preparation under both Training Mode 1 and 3 could be a long and expensive process which in all probability would be prohibitive from a cost-effective viewpoint If retraining of non vocational teachers becomes necessary, it is recommended that basic skill development be accomplished in the State Vocational Technical School System, with subsequent industrial experience prior to being placed on the job as a teacher of a Trade and Industrial subject

2 The state of Arkansas should increase the quantity and availability of in-service Vocational Industrial Education for existing Trade and Industrial teachers.

3 The state of Arkansas should increase the quantity and availability of pre-service Vocational Industrial Education to craftpersons and skilled workers who desire to become Trade and Industrial Teachers

4 The Associate Degree in Industrial Education is an excellent vehicle for getting Vocational Industrial Education to those who need, want, and can profit by it. The state of Arkansas should promote the use of this degree program as the first rung on the professional career ladder for Trade and Industrial Teacher Preparation

5 The University of Central Arkansas should expand the Industrial Education Department to include a full program for Trade and Industrial Teacher preparation Staffing should be separate and distinct from the Industrial Arts program but close coordination and cooperation should be effected between the two

# APPENDIX

A Review of Related Literature
B First Letter of Invitation
C Second Letter of Invitation & Survey
D Third Letter of Invitation and Appointment
E Cooperative Training Agreement
F Proposal for Associate Degree
G Syllabus I Methods
H Syllabus II Lesson Planning
I Syllabus III Organization & Management
J Syllabus IV Evaluation

## Review of Related Literature

No literature was discovered which touched directly upon the retraining of qualified non-vocational teachers to certifiable Trade and Industrial teachers in an industrial setting through a cooperative effort between an institution of higher learning and industry.

The reports on short term placement of vocational teachers in an industrial setting for up-grade training, reported mixed success. The report from New Hampshire for example, indicated that even this type of training was resisted by industry because of the so-called "slump" in business conditions.

There was an abundance of evidence that the efforts to train craftspersons and skill workers in the Techniques of Instructional Technology has been very successful and is an accomplished fact in nearly every state in the Union including Arkansas. This training although successful as to type is not adequate to provide sufficient trained craftspersons to fulfill Vocational Educational needs. Most on-going programs are directed toward in-service training with degrees at the baccalaureate and masters degree levels rather than toward pre-service training at the associate degree level.

The following extracts are examples of the literature which was reviewed:

Business, Industry and Vocational Education in New Hampshire, New Hampshire Department of Education, Division of Vocation-Technical Education, 105 Lond Road, Concord, New Hampshire 03301, October 14, 1975.

This report dealt with the up-dating of Trade and Industrial Teachers through an exchange program with industry.

The program which this paper reported was designed to open permanent avenues for an on-going Faculty, Businesses and Industry interchange to promote and improve education. It had the three following objectives:

1. To create a system to facilitate exchanges between business and the Vocational-Technical Institutions.
2. To gather data on potentialities of the program.
3. To place six-eight Vocational-Technical faculty in learningful positions in industry from four to eight weeks.

This program was initiated as a result of an annual report from the New Hampshire Advisory Council for Vocational-Technical Education which recommended that business and industry become more involved in Vocational-Technical Programs. "It is not enough to criticize, to harp on parochial ideas, or suggest ways programs can improve, but the situation calls for more interest, enthusiasm and cooperation from both ends of the spectrum. Education should visit with businesses and industry -- businesses and industry should visit with educators".

Numerous other actions were encountered which indicate that some sort of program of exchange between Education and Industry was needed.

A summary of the report indicated that only five successful placements were obtained and recommended that such a program was "a very risky venture for companies who wonder if they will get something out of it".

Recommendation #1 states: "This project as carried out in 1975, should not be carried out in 1976. The coming economic year indicates that "a program such as this would have a high probability of failure".

The experience encountered with Group I in the Arkansas Education Industry Exchange Program parallels those as reported in this position paper but obtained even less success.

Decisions Ahead for Vocational-Technical Education, Conference Proceedings Editor, John G. Porrca, Department of Vocational Technical Education, College of Education, The University of Tennessee, Knoxville, Tennessee, 1974, Page 11.

This was a report of a conference which focused on the immediate future of Vocational-Technical Teacher Preparation as demanded by society, including forthcoming Federal Legislation. This example was given: "In New York State, the Department of Education mandated that all future teacher education proposals and revisions be in terms of observable competencies and not in terms of college courses". In short, Federal and State Legislation is mandating competency based Teacher Education which can produce Trade & Industrial teachers that "can and will produce programs of broad occupational coverage, in-depth training, and flexible enough to meet changing needs of the community and area".

National Goals of Trade and Industrial Education and Meeting the Growth Demands for Training -- What are the Needs? Studebaker, Ernest B. and Rumpf, Edwin F., U. S. Office of Education, Washington, D. C., 1968.

This was a report of concurrent workshop sessions which attempted to answer the question: "What are the Nation-wide goals of Trade and Industrial Education? It points out those goals of vital importance which must be achieved if we are to meet the challenge of providing adequate training in occupational skills".

The following staffing needs were identified:

1. Expanded staff
2. Uniform certification requirements
3. Up-grading of personnel through incentives programs
4. Expanding leadership programs
5. Innovations in teacher education

The Preparation and In-Service Needs of Technical Teachers, Brown, Donald V., College of Education, The University of Tennessee, Knoxville, Tennessee, 1974.

This was a report of an attempt by the University of Tennessee to:

1. Acquire a generalized profile of existing Post-Secondary Technical teachers.
2. Inventory skills and knowledges deemed necessary by Technical teachers.
3. Identify various essentials of in-service activities and techniques which would be beneficial to Technical teachers.

The report included twelve items of high value items for technical teacher development:

1. Classroom management
2. Curriculum development
3. Diagnosis of learning problems
4. Performance objectives
5. New learning activities
6. Selection of teaching methods
7. Testing and evaluation
8. Developing course outlines
9. Directing laboratory and shop activities organization.
10. Using individualized instruction techniques
11. Motivating students
12. Student interacting in learning

Model Curricula for Vocational and Technical Teacher Education: Report No. V. General Objectives Set II. Cantrell, Calvin J., Chase, Shirley A., and Molnan, Marylin J. The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, 1972. This document reports the findings of research of "Performance-Oriented General Objectives which were intended to be used as guidelines for writing specific objectives for Vocational and Technical Teacher Education curricula. This publication presents ten major classifications of functions required of vocational teachers. They are as follows:

1. Program Planning, Development and Evaluation
2. Planning for instruction

Current College Catalogs. Catalogs from the following institutions of higher learning were consulted for curricular components which could provide the setting for teaching the proficiencies needed by Vocational-Technical Teachers.

1. Kansas State Teachers College of Pittsburg, Pittsburg, Kansas, 1975-77.
2. Ball State University, Muncie, Indiana, 1970-72.
3. The University of Tennessee, Knoxville, Tennessee, 1974-75
4. Oklahoma State University, Stillwater, Oklahoma 1976.
5. Texas A & M, College Station, Texas, 1976

Appendix B

**University of Central Arkansas**
CONWAY, ARKANSAS 72032

September 22, 1975

TO ALL INDUSTRIAL EDUCATION GRADUATES SINCE 1965:

Dear

The University of Central Arkansas Department of Industrial Education has a new program, yet in its infancy but growing. We want you, as part of the UCA Industrial Education family, to know about this new program and make suggestions, or perhaps become a part of it.

On July 1, 1975, Mr. Carl R. McEntire was hired to start and direct an "Education Industry Exchange Program." This is a two part program funded by the State Department of Vocational Education in cooperation with UCA to prepare teachers to teach vocational trade subjects.

This program may be of great importance to you. It is designed for those who have a baccalaureate degree in Industrial Education but cannot qualify to teach vocational trade subjects, but would like to do so. Are you interested? Read on.

Part I of the program is for an individual who has an IE degree, and in cooperation with and under the supervision of the Industrial Education Department, go into industry and gain graduate credit toward a masters degree while developing the trade experience necessary to qualify to teach a vocational class in that particular trade area. Are you still interested?

Part II of the program is designed for those who have already developed their trade experience, but need additional teacher-education in instructional technology.

We would like to hear from you, as one of our family, let us know what you are doing, and what you think about our new "Baby"--the "Education Industry Exchange Program."

Sincerely yours,

V.N. Hukill, Chairman
Industrial Education

P.S. For further information contact:
Mr. Carl McEntire, Director
Education Industry Exchange Program
University of Central Arkansas
Conway, Arkansas 72032

UNIVERSITY OF CENTRAL ARKANSAS
CONWAY
72032

Industrial Education Department

November 25, 1975

Dear

In mid September we sent approximately one hundred forty-one (141) letters to graduates of the UCA Industrial Education Program since 1965. This letter briefly mentioned the new Education-Industry Exchange Program, which was designed to provide opportunities to gain sufficient work experience in industry to qualify for Vocational-Teacher Certification. In addition, gaining college credit at the masters degree level.

This letter invited comment on the program as well as information about how you are getting along and what you are doing these days. The original assumption was that many of you were interested in becoming Vocationally certified. To date we have received only about ten (10) replies, none of which were interested in the E-IEP.

This sparse response has prompted questions as to whether the original assumption was in error or perhaps the design of the program does not meet the needs of those who may have expressed a need for such a program.

The enclosed questionnaire is an effort to determine the value of continuing this program or modifying it in someway which will more nearly meet your needs.

Thank you in advance for your time and assistance in this survey. If you would like to know the results please indicate this on the questionnaire. All questions will be confidential and will be used only for the purpose state above. Your immediate reply will be greatly appreciated.

Sincerely,

V.N. Hukill, Ed.D., Chairman
Industrial Education Department

Please return the questionnaire to:

Carl R. McEntire, Director
Education-Industry Exchange Program
University of Central Arkansas
Conway, AR 72032

## EDUCATION-INDUSTRY EXCHANGE PROGRAM

### Evaluation Questionnaire

November 25, 1975

## CONFIDENTIAL INFORMATION

Name ______________________________ Date ______________

Address ____________________________________________

Position ____________________________________________

School or Firm ______________________________________

Address ____________________________________________

Check each of the following statements as appropriate:

_____ 1. I am not intersted in the Education-Industry Exchange Program:

_____A. Presently Vocationally Certified.
_____B. Financial Reasons
_____C. Does not meet my needs. (Please state needs on reverse side)
_____D. Already have M.S. degree or higher.
_____E. Other (Please state briefly) ______________________________
______________________________________________

_____ 2. I am interested in the Education-Industry Exchange Program:

_____A. Would like more information.
_____B. Presently qualified, would like to become certified.

3. My present education level is:

_____A. B.S. + hours _____ .
_____B. M.S.

4. My industrial work experience as a ______________________________

_____A. 0-2 years.
_____B. 2-4 years.
_____C. 4-6 years.
_____D. Other ____________________

5. Request results of survey:

_____A. Yes
_____B. No

Please enter comments about the program or about yourself on the reverse side.

University of Central Arkansas
CONWAY, ARKANSAS 72032

February 5, 1976

SUBJECT: Education-Industry Exchange Program Information and Interview Request

Part I of the Education-Industry Exchange Program has been designed specifically to provide an opportunity for those persons who have a baccalaureate degree in Industrial Arts but do not have a saleable skill as defined by the State Laws and Regulations governing the certification of Vocational Teachers.

The skill requirement is two (2) years beyond the learner level in a given skill area. This varies with each skill area but is roughly interpreted as being 4 years at the learning level plus 2 years on-the-job in an industrial setting.

The candidates for this program will be able to select their desired skill area as well as the geographical area in which training is to be conducted, provided there is adequate training facilities available in the selected area.

A simple contract between the employer, employee (candidate for the program) and the University of Central Arkansas will be executed.

The provisions of the contract will require that the employer pay the candidate a salary equivalent to other employees with similar background, experience, and performing equivalent work, including all employee benefits. The employer will also be responsible for providing the trainee with an opportunity to gain experience in all facets of the skill area in accordance with a mutually acceptable training schedule. This schedule will be a part of the contractual agreement.

After gaining sufficient knowledge and experience, the trainee will be administered the National Occupational Competency Test for the area in which training was received. If a 50th percentile score or higher is acquired the trainee will be certified as a vocational qualified teacher by the State Department of Vocational, Technical, and Adult Education.

After becoming certified, placement in a Vocational program will be affected. The UCA Director of the E-IEP and the State Department of Vocational Personnel will affect a mutually satisfactory placement for the now certified teacher. This placement cannot be guaranteed to be at the trainee's selected home locality, but will of necessity be where the prevailing vacancies exist throughout the state.

Those persons who presently possess some experience in a specific trade area could possibly complete the necessary training period during a three (3) month summer period, between the regular school terms. Of course those who have no prior experience could require as much as two (2) years on-the-job training before becoming certifiable.

Upon completion of the work experience, and gaining a 50th percentile or higher score on the NOCT, the candidate could enroll at UCA in an independent studies course in Industrial Education for six (6) semester hours of graduate credit, which is applicable toward a masters degree in Industrial Education.

Hopefully this information is sufficient for you to determine if you are still interested in the E-IEP. If you are interested and desire a personal interview, please complete the blank form at the end of this letter, detatch, and return to:

Mr. Carl R. McEntire, Director
Education-Industry Exchange Program
University of Central Arkansas
Conway, Arkansas 72032

---

I desire a personal interview with the Director of the E-IEP on

Monday__________AM__________PM______________1976,
Date

Tuesday__________AM__________PM______________1976,
(CONWAY AREA ONLY) Date

Wednesday__________AM__________PM______________1976,
(BATESVILLE AREA ONLY) Date

Thursday__________AM__________PM______________1976,
(LITTLE ROCK AREA ONLY) Date

Firday__________AM__________PM______________1976.
Date

At______________________________________
Name and Address of Meeting Place

My Home Phone Number is____________________

My Work Phone Number is____________________

____________________
Signature

sl

## EDUCATION-INDUSTRY EXCHANGE TRAINING AGREEMENT

DATE ______________

1. This Industrial Program is organized to provide (Name of Trainee)______________________________ with ______________ months of scheduled work processes attached to and made a part of this training memorandum for the express purpose of (his or her) __________ learning the manipulative skills and acquiring knowledge and experience in the occupation of (Specify D.O.T.) ______________

2. The trainee is to be given the opportunity to progress through the various phases of the occupation under direct and close supervision of a qualified and experienced person.

3. The training agency agrees not to discharge any regular employee because of additional services that might be rendered by the trainee while in training .

4. The trainee will conform to and be subject to all rules and regulations adopted from time to time by the training agency for its regular employees, unless such rules are contrary to this memorandum.

5. The beginning and periodic increases in pay to the trainee shall be in accordance with the training agency policy and commensurate with other employees of like skills and experiences.

6. The training may be discontinued at any time by any person signing this memorandum, but agrees to notify the other parties at least __________ days in advance.

7. Safety instructions shall be a part of on-the-job instruction.

8. A schedule of organized and progressive work processes to be performed on-the-job and related technical instruction, including occupational safety, and hygiene, based upon an analysis of the occupation, shall be prepared as the trainees' course of study and is to be made a part of this memorandum.

9. Upon completion of the schedule of work processes the trainee should be able to satisfactorily pass the National Occupational Competency Test for the Occupation of ____________________________.

10. The University of Central Arkansas Industrial Teacher Educator will make regular visits to the place of employment to correlate on-the-job experiences.

Training Agency (Representative Signature) ______________________

Title ______________

Training Agency ______________________ Date ____________

Address ______________________ Phone ____________

Trainee (Signature) ______________________ Date ____________

Address ______________________ Phone ____________

Industrial Teacher Educator (Signature) ______________________

Title ______________

Address ______________________ Phone ____________

Date ______________

(Encl. #6)

# A PROPOSAL FOR A NEW PROGRAM
# SUBMITTED TO THE DEPARTMENT OF HIGHER EDUCATION BY
# THE UNIVERSITY OF CENTRAL ARKANSAS

## A NEW PROGRAM ENTITLED
## *ASSOCIATE DEGREE PROGRAM IN VOCATIONAL-INDUSTRIAL EDUCATION*

Proposed Starting Date
Summer 1977

Jefferson D. Farris
Signature of President
Date
11-1-76

Marvin E. DeBoer, 11-1-76
Signature of Chief Academic Officer
Date

Index:

Page

I. General Description of the Program 1

II. Role and Scope 3

III. Demonstrated Availability of Students 4

IV. Demonstrated Need 5

V. Similar Programs at Other Institutions 6

VI. Administration of the Program 6

VII. How the Program Will Supplement and Strengthen Existing Programs 6

VIII. Faculty Resources 6

IX. Library Resources 8

X. Physical Facilities 8

XI. Instructional Equipment 8

XII. Campus Approval 8

XIII. Accreditation 8

XIV. Impact Statement 9

XV. Funding of the Program 9

## Proposal For an Associate Degree
## in Vocational-Industrial Education

### I. General Description of the Program:

The University of Central Arkansas, Department of Industrial Education, proposes to offer an Associate Degree in Vocational-Industrial Education starting summer semester 1977.

The major purposes of this new degree program are to develop and improve the general and professional education competence of vocational-industrial teachers. This degree program will be open to all students who have a high school diploma or General Education Development (G.E.D.) equivalent and who have two years of trade and industrial experience above the learner level in a saleable skill as identified and defined in the *United States Department of Labor Dictionary of Occupational Titles.*

The new 61 hour associate degree program includes:

| | |
|---|---|
| 19 hours | General Education |
| 18 hours | Professional Vocational-Industrial Education |
| 18 hours | Credit for Technical Competence Based upon Proficiency Evaluations |
| 3 hours | Professional Education-Psychology |
| 3 hours | Elective |
| 61 hours | Total |

**General Education Requirements:**

| *Course No.* | | *Course Title* | *Hours* |
|---|---|---|---|
| Psych. | 1300 | General Psychology | 3 |
| Eng. | 1310 | Communications I | 3 |
| Eng. | 1320 | Communications II | 3 |
| Speech | 1310 | Basic Principles of Speech | 3 |
| Math. | | * | 3 |
| Science | | * | 4 |
| | | Total General Education | 19 |

* Courses taken must be compatible with trade subject taught and will be determined in consultation with the advisor.

**Professional-Vocational-Industrial Education – New Courses:**

| *Course No.* | *Course Description* | *Hours* |
|---|---|---|
| V.I.E. 2301 | METHODS OF INSTRUCTING IN VOCATIONAL-INDUSTRIAL SUBJECTS | 3 |

Methods and techniques of developing interactive instruction to assure the most efficient and effective learning environment.

V.I.E. 2302 PLANNING FOR INSTRUCTION IN VOCATIONAL-INDUSTRIAL EDUCATION .......................................... 3

The unit lesson format of developing and planning for individualized instruction in vocational-industrial subjects.

V.I.E. 2303 EVALUATION OF INSTRUCTION IN VOCATIONAL-INDUSTRIAL SUBJECTS .......................................... 3

The preparation and use of instruments for evaluating the instructional process and the attainment of educational objectives in trade and industrial subjects.

V.I.E. 2304 ORGANIZATION, MANAGEMENT, AND SAFETY IN VOCATIONAL-INDUSTRIAL SUBJECTS .......................... 3

The planning and development of school shops and laboratory facilities with emphasis upon the management of equipment, materials, supplies, and students to obtain maximum instructional efficiency in a safe environment.

V.I.E. 2601 DIRECTED TEACHING .......................................... 6

Directed teaching experience including activities such as lesson planning, lesson presentation, evaluating learning progress, including both information and skill development lessons in vocational or public school settings. On-site evaluations will be performed by a certified Vocational-Industrial Teacher Educator from UCA. Directed teaching will be scheduled after the candidate has completed the requirements for the Associate Degree in Vocational-Industrial Education. Seminar meetings will be held periodically throughout the semester. This course is applicable to the candidates for the Associate Degree in Vocational-Industrial Education only.

OR

Credit for this course may be obtained if all of the following criteria are met:

1. Possession of a current vocational teaching certificate in trade and industrial education.
2. Completion of three years of continuous satisfactory teaching experience in one specific trade area.
3. Completion of all other requirements for the Associate Degree in Vocational-Industrial Education.
4. Satisfactory completion of an evaluation, on-the-job, of both informational and skill development lesson planning and presentation by a qualified Vocational Industrial Teacher Educator from the degree granting institution.

Total Professional Vocational Education .................................. 18 hrs.

**Other Course Requirements:**

| | | |
|---|---|---|
| Psych. 3300 | Educational Psychology | 3 |
| | Elective | 3 |
| | Total | 6 |

*Credit for Trade and Industrial Competence: ................ 18 hrs.

*Vocational-industrial teachers are required by the State Plan for Vocational Education to have at least two years of trade or industrial experience beyond the learner level in a specific trade. Credit for this trade experience may be earned by evaluation only. One of the two following criteria must be met in order for the students to earn 18 hours of credit:

1. Completion of a comprehensive written, oral, and performance evaluation, obtaining a score of 70% or better on each part. The evaluation shall be performed by a vocational-industrial teacher educator and at least two craftsmen who are recognized journeymen in the trade area to be evaluated. Qualified journeymen shall be recommended by a Vocational Education Advisory Committee consisting of leaders from industry, labor, management, and education.

2. Completion of the appropriate National Occupational Competency Test by obtaining a score at the fiftieth percentile or higher.

## II Role and Scope:

The mission of UCA is to provide educational opportunities through various programs for students to become repsonsible and productive citizens who will contribute to the furture growth of Arkansas. The University seeks to realize its mission by striving to attain several broad objectives. Included among these objectives are the following: to provide students with a liberal or general education, to provide for the development of competencies needed by professions, to enrich the student's cultural background and to develop social interaction capabilities.

The University's goal is to create learning opportunities that will enable students to improve the quality of their lives and thereby improve the quality of the lives of others. This philosophy requires the University to examine continuously the needs of Arkansas and the needs of students in planning programs for the future.

Although UCA has changed its purpose from a single to a multiple purpose institution it is still committed to meeting needs in teacher education. Section IV of this proposal identifies the need for this associate degree program in Vocational-Industrial Teacher Education.

The purpose of the associate degree in Vocational-Industrial Education as stated within section I is within the role and scope of UCA. Furthermore the improvement of the professional competence of vocational-industrial teachers through this program should have an indirect beneficial effect on the quality of education received by students enrolled in classes taught by these teachers.

The University has adopted the philosophy that new programs should not detract from the quality of existing programs. With the available faculty and staff resources, a quality associate degree program in Vocational-Industrial Education can be offered without detracting from the quality of existing program. Furthermore, only those programs which the University is capable of offering at a high level of quality shall be initiated or maintained. This new associate degree program will supplement and complement the existing Industrial Education program at UCA.

## III. Demonstrated Availability of Students:

As of July 1, 1976 there were 45 schools within a 100 mile radius of UCA, that employ 450 teachers of vocational-industrial subjects. The majority of these teachers have had little or no formal education beyond the high school level. The State Department of Education, Division of Vocational, Technical and Adult Education have certification policies which require these instructors to complete a teacher education program in Vocational-Industrial Teacher Education before or after initial employment.[1]

In July of 1975 the Industrial Education Department of UCA conducted special pre-service orientation workshops for new vocational-industrial teachers at four different sites in Arkansas. These workshops were offered upon request of the staff of the Division of Vocational Education, State Department of Education and were designed specifically to orient new teachers employed to teach in new area state vocational-technical schools. Over 90 teachers from 12 schools participated in these workshops. During the workshop participants were surveyed in order to determine their needs and interest in additional vocational teacher education courses. Most participants expressed a desire for additonal courses that would be included in an associate degree program in Vocational-Industrial Education.

In addition to those already employed in state vocational schools and public secondary schools, there are potential students for this degree program currently employed in industry and the Military who are interested in becoming certified to teach trade and industrial subjects in vocational education.

### A. Projected Enrollment.

The projected enrollment from Summer 1977 through Spring 1981 in this new associate degree program at UCA is shown in Table I.

TABLE I
PROJECTED ENROLLMENT
IN VOCATIONAL-INDUSTRIAL EDUCATION
ASSOCIATE DEGREE PROGRAM AT UCA
1977 to 1981

| FY | SUMMER Terms | | FALL | SPRING |
|---|---|---|---|---|
| Yr. | 1st | 2nd | | |
| 1977-78 | 20 | 20 | 20 | 40 |
| 1978-79 | 20 | 20 | 40 | 40 |
| 1979-80 | 40 | 40 | 80 | 80 |
| 1980-81 | 40 | 40 | 80 | 80 |

These figures represent only some of those persons who will need to meet the minimum certification standards for teaching vocational-industrial education subjects. Not included are other potential students such as those employed in industry and the Military who would probably enroll in the course after the program becomes established. Since most of the students will enroll in the classes on a part-time basis, completion of the associate degree requirements will take approximately three to four years.

## IV. Demonstrated Need:

Vocational trade and industrial education programs have expanded rapidly in public secondary schools and post-secondary schools in Arkansas. From 1973 to 1975 there was an 8% increase in enrollment.[2] From 1976 to 1981 there is a 47% projected increase in enrollment.[3]

Such enrollment increases have and will continue to generate an increased demand for vocational-industrial teachers. The state staff in the Division of Vocational Education, Arkansas State Department of Education have projected the following additional vocational-industrial teacher needs between 1977 and 1980: 1977 to 1978, 85 teachers; 1978 to 1979, 98 teachers; 1979 to 1980, 110 teachers.[4] The figures include teachers needed for expansion of programs (75%) and replacement of teachers lost due to attrition (27%). Many of the 293 teachers needed during the next 4 years could enroll in the proposed associate degree program at UCA.

The rapid expansion of trade and industrial programs has created major staffing problems. There is a wide variety of subjects taught in these programs ranging from Basic Auto Mechanics to Advanced Electronics. This has precluded any one teacher education institution from providing pre-service and in-service programs in all of the specialized skills that are taught in the vocational schools. Consequently skilled workers who possess only a secondary education or equivalent diploma are hired to teach specialized trade and industrial subjects. These teachers have a very limited understanding of the teaching and learning processes. Consequently their effectiveness in communicating knowledge and skills to the learner is also limited.

Recently, the State Board for Vocational Education received approval from the United States Office of Education to accredit the post high school vocational-technical schools. The inherent evaluations associated with the accreditation process will most likely result in recommendations for the improvement of instructional skills and the pursuit of an associate or baccalaureate degree by currently employed vocational-industrial teachers.

The State Board for Vocational Education has initiated an "Open Door" policy for enrolling students in the state vocational-technical schools. This policy will necessitate a change from traditional instructional approaches to a more individualized competency based program. Professional vocational courses included in the proposed program can help vocational-industrial teachers with this transition.

The preceding paragraphs illustrate a need for professional improvement of current and newly employed vocational-industrial teachers during the next 4 years. This need can best be met through an associate degree program in Vocational-Industrial Education.

## V. Similar Programs at Other Institutions

No other institution in Arkansas offers an associate degree in Vocational-Industrial Teacher Education. The Universities of Arkansas at Fayetteville and Pine Bluff offer programs in vocational-industrial teacher education at the baccalaureate degree level. Other universities such as Western Kentucky University have developed similar two year associate degree programs for vocational-industrial teachers.

## VI. Administration of the Program and Cost

The new associate degree program will not require any changes in the current administrative structure at UCA. The instructors for the proposed degree program will work under the Chairman of the Industrial Education Department in the College of Fine and Applied Arts and Sciences and will have a staff relationship with the director of the Center for Vocational Teacher Education.

The Director of the Center for Vocational Teacher Education will coordinate this program with other vocational teacher education programs at UCA and administer funds that may become available from the State Board for Vocational Education upon their approval of the Annual Plan for Vocational Teacher Education.

No additional on-campus facilities will be required. The courses for the proposed associate degree program will be offered primarily at night and off-campus. The State Department of Education, Division of Vocational-Technical and Adult Education will provide facilities gratis for the off-campus classes.

## VII. How the Program will Supplement and Strengthen Existing Programs.

The proposed associate degree in Vocational-Industrial Education will better serve students who are preparing for employment or who are already employed as vocational-industrial education teachers. The current programs at UCA are not designed to serve this clientele. This associate degree in Vocational-Industrial Education is expected to supplement and complement the existing program in Industrial Education at UCA by providing another degree option for those who have a high school diploma or GED equivalent, and who already possess a saleable trade skill. With some modification, this associate degree program could articulate with the existing Baccalaureate degree programs in Industrial Education at UCA and other institutions.

## VIII. Faculty Resources

A. The four staff members of the Department of Industrial Education are qualified to serve as vocational-industrial teacher educators according to standards of the Arkansas State Department of Education, Divison of Vocational, Adult, and Technical Education.

B. Faculty qualifications of the staff in the Industrial Education Department at UCA are outlined in Table II.

## TABLE II
## QUALIFICATIONS OF THE INDUSTRIAL EDUCATION FACULTY AT UCA
## 1976

| | | | |
|---|---|---|---|
| Hukill, V.N. | Ed.D. | University of Missouri | 1 year Industry<br>3 years USAF<br>7 years College Instructor<br>23 years College Professor<br>10 years Department Chairman (concurrent with above figure) |
| Jordan, K. F. | Ed.D | University of Missouri | 4 years Industry<br>4 years College Instructor<br>7 years College Professor |
| O'Dwyer, Bernard | MSE | University of Central Arkansas | 4 years USAF<br>1 year Welder and Machinist in Industry<br>7 years Machine Shop T&I and Industrial Arts, Secondary School<br>7 years College Instructor in Areas in Metalworking<br>4 years College Assistant Professor in Metalworking Area |
| Powers, C. L. | MSE | University of Central Arkansas | 1 year Oil Field Construction Work<br>2 years Motorcycle Mechanic<br>3 years Operation Own Motorcycle Repair Shop<br>5 years Junior High Instructor, N.L.R. Schools<br>3 years Director of Industrial Arts and Vocational Education in N.L.R. Schools<br>8 years College Instructor<br>2 years Assistant Professor |

C. The professional, vocational, industrial education courses for this degree program will be taught by the existing industrial education staff. The staff will accommdate the students and courses in the vocational-industrial education program by scheduling some of the courses during the summer, employing the industrial education staff for additional summer teaching, involving other vocational teacher educators on campus in teaching common core vocational teacher education courses, assigning staff an overload evening class when necessary, and employing part-time instructors when needed.

D. Current faculty shall be supplemented when needed by utilization of qualified part-time instructors through the Department of Continuing Education until growth of the program warrants additional new faculty.

E. New faculty must meet qualifications as established in the current State Plan for Vocational Education, State Department of Education.

F. The salary level of a new faculty shall be commensurate with qualifications and current faculty salaries.

## IX. Library Resources

The UCA library contains the following documents related to vocational-industrial education:

| | |
|---|---|
| Books | 3,514 |
| Periodicals | 18 (+ 30 indirectly related) |
| Monographs | 100$^+$ |
| Microfiche ERIC | (All available on Vocational Technical Education) |

## X. Physical Facilities

The faculty, equipment, and materials for this program will be housed in the Department of Industrial Education. No additional facilities are needed.

## XI. Instructional Equipment

No additional instructional equipment will be required to initiate this program.

## XII. Campus Approval

This proposal was approved by the University of Central Arkansas Undergraduate Council on April 20, 1976, by the Council of Deans on May 4, 1976, by the President on November 1, 1976, and by the Board of Trustees on November 17, 1976.

## XIII. Accreditation

The University of Central Arkansas Industrial Education Program is fully accredited by the North Central Association of Colleges and Secondary Schools and the National Council for Accreditation of Teacher Education at the Baccalaureate and Master of Science Degree levels. An accreditation visit was made in 1968 and the next contact is expected in 1978.

## XIV. Impact Statement

A. It is anticipated that approximately 10 to 15 percent of the students who will enroll in this 2 year associate degree program will be Black.

B. Four current faculty members will be involved in the program of which all are white males.

C. Courses and the related services for this new degree program for the first two years can be provided with the existing University staff. This conclusion was reached after a review of projected enrollment (see Table I) and the development of a plan for reorganizing the industrial education staff assignments and course schedules. Further details of the plan are provided in section VIII. Thereafter, should increasing enrollment require expanding the staff, every effort will be made to insure that both women and minorities will have the opportunity to apply for future faculty positions . The University is an Equal Opportunity Affirmative Action Employer.

D. Notices about the program will be sent to school systems throughout the State. The industrial education staff at UCA will discuss the program with vocational teachers in public and state vocational schools during various in-service meetings. This will enable the faculty to encourage Black teachers to enroll in the program.

E. The above indicates that this program will accelerate the University's efforts toward student and faculty desegregation.

F. The anticipated affects of this new degree program on the growth of desegregation in higher education in Arkansas is presented in the following supporting statements.

1. The current and projected number of vocational-industrial education teachers was identified in Sections III and IV of this paper.
2. Approximately 10% of the current vocational-industrial teachers are Black. Most are male.
3. There is an emphasis in Arkansas by public school officials on recruitment placement of minorities in new teaching positions. Therefore the number of Blacks and women to be employed as vocational industrial teachers will likely increase.
4. There are currently 25 female vocational-industrial teachers in Arkansas (12% of total).
5. The program has the potential to contribute to the University's desegregation program by providing a new degree option for Black vocational trade and industrial teachers. Efforts will be made to recruit Black students in the new degree program.
6. There is no similar two year associate degree program in the state of Arkansas.

## XV. Funding of the Program

Initially, the program must be funded from enrollment produced funds and State General Revenue Funds.

Once the program and the Annual Plan for Vocational Teacher Education is approved by the appropriate administrative bodies, UCA will become eligible for funds under the existing Educational Professions Development Act and the Vocational Education Act of 1968 administered through the State Department staff in vocational education.

Current federal legislation for vocational education in both the House and Senate has provisions for funds for vocational teacher development. Thus, there could be an additional source of funds for this new degree program.

Most of the administrative and instructional costs for the new degree program will be covered in the existing budget allocated to the Department of Industrial Education at UCA. The anticipated additional expenditures for this new degree program are presented in Table IV.

## TABLE IV

## ESTIMATED EXPENDITURES
## FOR VOCATIONAL-INDUSTRIAL EDUCATION ASSOCIATE DEGREE PROGRAM AT UCA
## 1977 to 1980

| Item No. | Account & Object Classification | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|
| Additional Costs | | | | | |
| 1. | Salaries: | | | | |
| | a) Teacher Educator* | | | 15,000 | 16,050 |
| | b) Summer Employment | 1,485 | 1,485 | 660 | |
| | c) Part-time Instructors** | | | | |
| | d) Off-campus Overload Stipend*** | 1,650 | 1,650 | 1,650 | 1,650 |
| 2. | Retirement and Matching | 524 | 524 | 2,890 | 2,956 |
| 3. | Supplies and Expenses | 500 | 500 | 500 | 500 |
| 4. | Library | 50 | 50 | 100 | 100 |
| 5. | Faculty Research and Development | -- | -- | -- | -- |
| 6. | Travel*** | 650 | 860 | 900 | 1,000 |
| 7. | Supervising Teachers | | | 500 | 600 |
| 8. | Sub-total | 4,859 | 5,069 | 22,200 | 22,856 |
| 9. | Facilities | -- | -- | -- | -- |
| 10. | Total | 4,859 | 5,069 | 22,200 | 22,856 |

* Should enrollment expand as anticipated, one additional vocational-industrial teacher educator will need to be hired in 1979 to teach classes and supervise student teachers.

** The estimated expense for part-time instructors will be dependent upon future enrollment and the need for their involvement.

*** Faculty and travel costs for off-campus classes will be recovered through off-campus tuition fees.

The anticipated income for this new degree program is presented in Table V.

### TABLE V
### ESTIMATED INCOME
### FOR THE VOCATIONAL-INDUSTRIAL ASSOCIATE DEGREE PROGRAM AT UCA
### 1977 to 1980

| Item No. | Source of Funds | Fiscal Year 77 | Fiscal Year 78 | Fiscal Year 79 | Fiscal Year 80 |
|---|---|---|---|---|---|
| 1. | Federal Grants | nil | nil | nil | nil |
| 2. | Private Gifts & Grants | nil | nil | nil | nil |
| 3. | Local Institution | 5,670 | 6,705 | 15,222 | 16,706 |
| 4. | State Board for Vocational Education* | | | | |
| 5. | Sub-Total | 5,670 | 6,705 | 15,222 | 16,706 |
| 6. | State General Revenues** | nil | nil | 6,978 | 6,150 |
| 7. | Total | 5,670 | 6,705 | 22,200 | 22,856 |

* Upon approval of UCA as a vocational teacher training institution by the State Board of Vocational Education, this program will become eligible for reimbursement from state and federal funds allocated for vocational teacher education.

** Additional funds requested.

References Cited:

1. Arkansas State Department of Education, Division of Vocational, Technical and Adult Education, 1976, *Program Policies Related to State and Federal Funding of Secondary and Adult Programs in Vocational Education*, p. 21.

2. Arkansas State Department of Education, Division of Vocational, Technical and Adult Education, 1975, U.S.O.E. Annual Program Report State of Arkansas, "Enrollment in Vocational Education 1973-74, 1974-75."

3. Center for Career and Vocational Teacher Education, *Western Kentucky University Long Range and Annual Plan for Vocational Teacher Education*, 1976.

4. State Board for Vocational Education, State of Arkansas, 1976, *State Plan for the Administration of Vocational Education Part II*, "Table 4, Projections of State Enrollments", p. 53.

5. *Ibid.*, "Table 8, Actual and Projected Demand for Vocational Education Personnel", p. 61, 62.

THE UNIVERSITY OF CENTRAL ARKANSAS
INDUSTRIAL EDUCATION DEPARTMENT

# METHODS OF INDSTRUCTING IN VOCATIONAL-INDUSTRIAL SUBJECTS

Vocational-Industrial Education 2301

Three Semester Hours
Credit

SYLLABUS FOR THE COURSE

January 1977

THE UNIVERSITY OF CENTRAL ARKANSAS
Conway, Arkansas

Vocational-Industrial
Education 2301

## METHODS OF INSTRUCTING IN VOCATIONAL INDUSTRIAL SUBJECTS

Course Content:

| | |
|---|---|
| Unit I. | Introduction |
| Unit II. | The Teacher |
| Unit III. | Learning Theory |
| Unit IV. | Motivation and Safety of the Learner and Teacher Liability |
| Unit V. | How to Teach |
| Unit VI. | Planning for Instruction |
| Unit VII. | Practice Teaching |
| Unit VIII. | Public Relations |
| Unit IX. | Course Evaluation |

## INTRODUCTORY STATEMENT

Vocational-Industrial Education 2301, Methods of Instructing in Vocational-Industrial subjects, is designed to provide the teacher of Vocational Education an opportunity to learn the techniques of developing interactive instruction for Vocational-Industrial subjects, which will assure the most efficient and effective learning environment for the Vocational-Industrial student.

## I. COURSE ORGANIZATION

A. This course is organized into nine units of instruction which are outlined in separate assignment sheets in this syllabus. Each unit contains an introduction, unit objectives, specific assignments, references, and a group of statements and/or questions to be dealt with according to each set of instructions.

B. The assignment will specify exactly what you are expected to do including the readings, investigations, and reports required in each unit.

C. The statements and questions are intended to guide your reading and to present problems which should help you to interpret the facts, evaluate ideas, and formulate judgements.

D. Comprehensive evaluations will be made:

1. At the conclusion of each unit
2. After the practice teaching assignment
3. At the conclusion of the course

## II. WRITTEN ASSIGNMENTS

A. The assignments specified in each unit should be prepared in a careful and scholarly manner. Unless your writing is perfectly legible, your written work should be typed. The maximum length of each report will be specified in terms of double-spaced typed material.

B. It is expected that references should be used in the preparation of assignments. In all cases where direct quotations are used, give footnote references, including in sequential order:

1. Author
2. Exact title
3. Edition and volume
4. Name of publisher
5. Location of publisher
6. Date of publication
7. Page or chapter of quotation

C. Where no direct quotations are given in a report, simply list a bibliography of the materials utilized in preparing the assignment.

D. Attach a cover page to each written assignment providing the following information:

1. Your name
2. Course number and title
3. Unit number
4. Exact title of your paper (not the title of the unit)
5. Date paper was prepared

E. Staple the pages together in the upper left corner. Do not fold and do not use binders or folders!

## III. COURSE OBJECTIVES

This course has been structured to provide students with an opportunity to gain experiences which should enable them to:

A. Develop an understanding and appreciation of the unique relationship that necessarily exists between the learner and the teacher to create the most effective learning environment.

B. Develop an understanding and the ability to apply the basic principles of learning and teaching in the Vocational-Industrial Education environment.

C. Develop an understanding and the ability to organize and plan lessons in accordance with principles and practices in Vocational-Industrial Education.

D. Develop an understanding and the ability to apply the various methods, devices, and techniques which are most effective in teaching Vocational-Industrial Education classes.

E. Make progress toward the completion of certification requirements for Vocational-Industrial teachers.

## IV. BASIS OF EVALUATION

| | | | |
|---|---|---|---|
| A. | Objective Tests | | |
| | 1. Unit tests | 20% | |
| | 2. Final test | 20% | |
| | | TOTAL | 40% |
| B. | Unit Reports | | |
| | 1. Quality | 05% | |
| | 2. Punctuality | 05% | |
| | | TOTAL | 10% |
| C. | Practice Teaching Assignment | | |
| | 1. Lesson Plans | | |
| | a. Informational lesson | 10% | |
| | b. Skill development lesson | 10% | |
| | 2. Presentation | | |
| | a. Information lesson | 15% | |
| | b. Skill development lesson | 15% | |
| | | TOTAL | 50% |
| | | GRAND TOTAL | 100% |

## UNIT I

## INTRODUCTION

To teach is to learn. -- Japanese Proverb

Fools are not born: they are educated! --Elbert Hubbard

Work is not a curse, it is the prerogative of intelligence, the only means to manhood, and the measure of civilization. Savages do not work. --Calvin Coolidge

### I. INTRODUCTION

A. Vocational-Industrial Education is that branch of education which endeavours to prepare the skilled craft persons to teach others their skills and technical knowledge of a specific trade. It also provides in-service training which will upgrade those skilled craft persons who are presently instructing such classes.

B. The teacher of Trade and Industrial (T&I) classes is a manager who coordinates the use of facilities, materials, and equipment with experiences for the learner. He uses techniques and procedures which will yield the most efficient and safe learning environment for the learner to learn the basic skill and technical knowledge of the job in the shortest possible time.

C. The T&I teacher is concerned with the development of skills, attitudes, and technical knowledge. Therefore, the evaluation of progress must involve the measurement of change in the psychomotor and affective domain of learning as well as the cognitive.

D. This course of instruction will afford the learner the opportunity to analyze the instructor and his job. In the following units, the problems faced by the T&I teachers, with possible solutions, will be investigated in depth.

### II. OBJECTIVES

A. General: Introduce student to classroom procedure and familiarize student with scope and content of course.

B. Specific:

1. Student introduces self to class by stating:
    a. Name
    b. School and place of employment
    c. Subject taught
    d. Other pertinent information
2. Student will be able to state or list objectives of the course.
3. Student will become familiar with special terminology which will be used in the courses.
4. Student will be able to explain the course grading system.
5. Students will be able to state name of textbook used in the course including author, publisher, and date of publication.
6. Students will be able to list materials and supplies required for the course.
7. Students will be able to list and describe the methods of instruction which will be used in teaching the course.
8. Students will be able to state or list the course unit number and titles in a correlated sequence.

## III. ASSIGNMENT

A. Read Chapter I in text.

B. Read the asterisked references first then others as you think time permits.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

See Bibliography at the end of this syllabus for complete reference data. Ref 1*, Chapter 1; Ref. 2, Chapter 1 and 11; Ref. 4, Part 1-5; Ref. 8*, Chapter 2; Ref. 10*, Chapters 1 and 3; Ref. 14, Chapters 1, pages 1-3 and Chapter 16; Ref. 19* page 1-82; Ref. 21, Chapters 1,2,8,9,11,12,13 and 17, 21, part I and Ref. 23* pages 3-77.

## V. STUDY QUESTIONS

A. What personal qualities should you cultivate, improve, or strengthen in order to develop good rapport and more effective learning among trainees? (Ref. #8, pages 15-19).

B. Contrast and compose the likeness and differences between professional trainer and a school instructor. (Ref. #10, pages 2-4).

C. Contrast and compose the good instructor/trainee with some of the undesirable types (Ref. #10, pages 23-31).

D. What are some of the reasons why persons teach? (Ref. #19, pages 2-6).

E. Define the following terms and give examples of each:

1. Industrial Education
2. Vocational Education
3. Vocational Industrial Education
4. Trade and Industrial Education
5. Industrial Arts Education
6. Technical Education
7. On-the-Job Training
8. Cooperative Education

F. All the questions at the end of chapter 1, Reference #1.

## UNIT II

## THE TEACHER

Teaching is the planned or purposeful effort to help a learner to learn.

You cannot teach a man anything; you can only help him to find it within himself. --Galeleo

## I. INTRODUCTION

A. The teacher is responsible for providing meaningful and desirable experiences which will stimulate the learner so that the desired learning takes place effectively. Learning depends upon these experiences and upon the manner in which he passes through them. This is where training actually takes place and it involves instructional planning, use of appropriate methods and techniques of teaching and use of teaching aids.

B. An essential element in giving validity to the important role of the Vocational-Industrial teacher is his competency in his particular substance field. The student depends upon the teacher to provide him with the skills and understanding that will result in occupational competency. Confidence in the teacher is an essential element if the student is to be highly motivated. In occupational training this confidence is based in large measure on whether or not the teacher can give proof of his ability to perform successfully in the occupation for which the student is being trained.

C. The future of our society depends upon a work force that approaches its task of building a greater America with an understanding of its responsibilities. The Vocational-Industrial teacher has a major role in this important task.

Beaumont, John A., The Key to Vocational Sound Teacher Education, American Vocational Journal, 1966, p. 18.

## II. OBJECTIVES

A. General: To develop an understanding and concept of the teacher's qualifications, abilities, and role in the educational process.

B. Specific:

1. Identify and describe the qualities of a good teacher.
2. Identify and define the success factors of a good teacher.
3. Identify and describe abilities of a good teacher.
4. Identify and describe responsibilities of a teacher.
5. Establish and manage a self-appraisal program.

## III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Prepare informal answers to the questions at the end of Chapter 1, reference 1 (Text).

C. Prepare a student evaluation sheet of the instructor.

D. Be prepared to make comments during class discussion regarding the study questions.

## IV. REFERENCES

See Bibliography at the end of this syllabus for complete reference data.

Reference 1*, Chapter 1; Reference 2*, Chapter 1 and 11; Reference 3, part 1, 2 units 7, 9, 10, 12, 13, 14; part 3; and part 5; Reference 14*, Chapter 13 and 14; Reference 21, Chapter 12.

## V. STUDY QUESTIONS

A. Define the term teaching.

B. List the six success factors _____________ instructor
  1. Describe method and give an example.
  2. Define technique and give an example.

C. Why is desire so important in becoming an instructor, give hypothetical illustration.

D. Describe how to develop good personal relations and give illustrations.

E. What are the rewards of a teacher?

F. What is meant by the statement "The ten imperative needs of Youth"?

G. List the responsibilities of the instructor to:
  1. Students
  2. Administration
  3. Community
  4. Profession
  5. Self

H. Describe a self-appraisal system, procedure, or process.

## UNIT III

## LEARNING THEORY

Learning - To get knowledge of or skill in an Art, Trade, etc., by study, experience, instruction, etc.

Learning is a feast for the mind and spirit, and a source of lasting joy. --Gilbert Highet

If the pleasure of learning is Universal, why are there so many dull, incurious people in the world. --Ibid.

> Mortal I know I am, short-lived; and yet whenever
> I watch the multitude of swirling stars then I no
> Longer tread this earth, but rise to feast with God,
> And enjoy the food of the immortals. --Ptolemy.

## I. INTRODUCTION

A. Maturation or learning, or a combination of the two, is the means by which lasting changes in persons occur. Maturation is a developmental process within which a person from time to time manifests different traits, the "blueprints" for which have been carried in his cells from the time of conception.

B. Learning, in contrast with maturation, is an enduring change in a living individual that is not heralded by his genetic inheritance. It may be a change in insights, behavior, preception, or motivation, or a combination of these.

C. Man shares with other mammals some primary organic drives such as hunger, thirst, sex, cravings for oxygen, warmth, and rest, and a few primary aversions such as fear and rage.

D. A desire to perceive, understand, imagine, and deal with ideas is just as much a part of human nature as are the specific organic drives and aversions. Accordingly, man derives satisfaction from using his natural and acquired abilities. In his social, aesthetic, economic, religious, and political life, he shows a tendency to explore. Thus, the very process of learning, both concrete and abstract, can become satisfying to him.

Bigge, Morris L. Learning Theories for Teachers 2d Ed. Harper & Rowe, New York, 1971.

## II. OBJECTIVES

A. General: To develop an understanding of the processes of learning. Upon completion of this unit the learner will be able to:

B. Specific:

1. Define the term Learning.
2. List the six (6) senses through which we perceive experiences.
3. Explain the Principles of Learning as listed on the hand-out.
4. List and describe the four (4) laws of learning and give an example of each.
5. List and describe the important factors which aid us in determining individual differences.
6. Recognize individual differences in learners.

## III. ASSIGNMENT

A. Read chapters 2, 3, and 13 in Text.

B. Read the asterisked references first, then others as you think time permits.

C. Be prepared to make comments during class discussion regarding the study questions.

## IV. REFERENCES

Reference 1*, Chapters 2, 3, and 13; Reference 3*, Chapters 1, 2, 3, 4, 9, 10, and 11; Reference 6*, Chapters 16 and 17; Reference 12; Reference 14, Chapters 8.

## V. STUDY QUESTIONS

A. Define the term Learning.

B. List the six senses through which we perceive and describe how each affects learning.

C. List the four (4) laws of learning. Give an illustration of each showing how learning occurred.

D. List and explain eight (8) major factors in which individuals differ in learning. Give illustrations to substantiate these concepts.

E. All questions at the end of Chapters 2, 3 and 13 of Reference 1.

## UNIT IV

## MOTIVATION & SAFETY OF THE LEARNER & TEACHER LIABILITY

Motivate - To provide with a motive

Motive - Some inner drive, impulse, or intention that causes a person to act in a certain way.

Incentive - An outer stimulus or reward that encourages one to action.

Inducement - An outer stimulus that tempts or entices one to act.

"Nobody has ever thought himself to death." --Gilbert Highet

## I. INTRODUCTION

When a person develops a state of tension resulting from unsatisfied need, we say that he is motivated. Motivation may spring from a variety of needs, ranging from those that are largely physiolgical in origin to those that are primarily psychological, such as that engendered by a conflict in a religious belief. A motive may appear as a generalized need to obtain a particular reward. The person's aim becomes the reduction of tension, which can occur only as the need is wholly or partially satisfied.

Obviously, motivation plays a central role in learning. Students who are motivated work purposefully and energetically. They display few, if any, "discipline" problems. Consequently, a teacher who can keep his students well motivated, has won more than half the battle. --Ibid.

Attitudes have their roots in the mental and emotional depths of an individual. Therefore, a large percentage of industrial accidents is traceable to faculty attitudes of the workers. Motivation of students toward development of good safety habits and attitude should be a vital ingredient of a planned program of Vocation-Industrial Education.

## II. OBJECTIVE

A. General:

1. To develop an understanding of factors which motivate one to action.
2. To develop safety habits and attitudes
3. To understand limits of Teacher liability

B. Specific:

1. Define motivation.
2. Compare and contrast the value system in relationship to motivation.
3. Compare and contrast motivation vs. submission.
4. List ten of the factors which highly motivated students and low motivated students disagree upon.
5. List three things which affects studen motivation.
   a. Which the school cannot control
   b. Which the school can control.
6. List four things which the instructor can do to assist motivation
7. Discuss how motivation affects the accident rates in industry.
8. Define the term liability.
9. Discuss how liability affects the teacher in the Vocational industrial Education environment.

## III. ASSIGNMENT

A. Read chapter 7 in text.

B. Read the asterisked references first, then the others as you think time permits.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

See Bibliography at the end of this syllabus for complete reference data.

Reference 1* Chapter 7; Reference 3 *, Chapters 10 and 11; Reference 24*, Chapter 10.

## V. STUDY QUESTIONS

A. All the questions at the end of Chapter 7 of text

B. Define:
   1. Intrinsic Motivation
   2. Extrinsic Motivation

C. Describe what constitutes demotivation.

D. Define teacher liability.

E. Describe the principle of common law immunity

F. What is meant by abrogation of common law?

## UNIT V

## HOW TO TEACH

Method - A way of doing something!

Technique - The expertness with which a method is used.

Let not your tongue run away with your brains. --French Proverb

Keep your face to the sunshine and you cannot see the shadow --Helen Keller

A likely impossibility is always preferable to an unconvincing possibility. --Aristotle

### I. INTRODUCTION

It has long been recognized and stressed in Industrial Education classes that a person should use the proper tools for each application. It has further been emphasized that a good understanding and a degree of skill in using tools and equipment is necessary for outstanding performance. A technician knows what equipment is necessary and which tools to select for a particular purpose. Vocational-Industrial teachers are in a similar position. They have a variety of teaching methods at their disposal and if they are effective teachers, they know which ones to use for a particular teaching-learning situation.

The analogy may appear simple, yet the concept of meaningful Instructional Methodology is quite complex. It is not a matter of today you show and tomorrow you tell. Teaching methods require study, patience, and practice to become apart of the personality and concious being of the teacher. To bring about a particular behavior change on the part of a student, a teacher needs a complete set of teaching tools available. Since students are all defferent in their attitudes and their abilities to learn, an appropriate method of teaching a given concept for one may be inadequate for another.

Instructional Methodology - the ways and means a teacher adapts to guide their students through the various learning activities to accomplish the desired goals. --Baird, RonaldJ., Contemporary Industrial Teaching

### II. OBJECTIVES

A. General:

To explore and develop an understanding of the various methods commonly used to instruct Vocational-Industrial classes.

B. Specific:

1. Define the term "Teaching Method" and list at least six common teaching methods used in teaching Vocational-Industrial classes.

2. Define technique and give an illustration of how technique affects learning.
3. Catagorize methods into four general classifications.
4. Describe the demonstration method and list at least six important points about a good demonstration.
5. Outline the practice teaching assignment requirements.
6. Describe the characteristics of a good oral questions.
7. List the purposes of oral questions and give an example of each.
8. List the kinds of oral questions and give an example of each.

## III. ASSIGNMENT

A. Read Chapters 7, 8 and 9 in the text.

B. Read the asterisked references first then others as you think time permits.

C. Be prepared to make comments during class discussion regarding the study questions.

## IV. REFERENCES

Reference 1*, Chapter 7, 8 and 9; Reference 2 *, Chapter 8; Reference 3, Chapter 10; Reference 14, Chapters 5 and 7; Reference 22, Part 6.

## V. STUDY QUESTIONS

A. All questions at the end of Chapters 7, 8 and 9 of text.

B. Single space all questions at the end of Chapter 8, Reference 2.

# UNIT IV

# PLANNING FOR INSTRUCTION

Planning - To make an outline draft or devise a scheme for doing, making or arranging something.

There is nothing so useless as doing efficiently that which should not be done at all. --Peter F. Drucker

Why is it that there is never enough time to do a job right, but always enough time to do it over? --Anonymous

Kites rise highest against the wind--not with it. --Winston Churchill

## I. INTRODUCTION

The psychology of learning has shifted emphasis from teacher domination to student involvement. The responsibility for learning has been placed in the hands of the students. The teacher has become responsible for planning learning activities that provide for student motivation, opportunity, and involvement. The educational theory evolving from this means that one does not teach a learner, but rather one provides an atmosphere and opportunity for the learner to learn. It is within this framework, then, that the teacher should approach the task of formulating plans for the variety of learning activities necessary to develop the desired concept, skills, and principles in a given course.

When an architect designs a house, consideration must be given to the client, the trends in design, the characteristics and costs of materials, the location, and many other factors. With the complete plans, the builder may proceed with confidence because he knows that all elements with which he will be concerned have been developed into a unified pattern.

Planning a lesson or course of study is a similar process. The lesson or course of study is a written document that provides a planned and logical organization for the content and instructional processes designed to meet a given educational goal.

## II. OBJECTIVES

A. General:

The learner will develop the knowledge and ability to plan both informational and skill development lessons.

B. Specific:

1. Define a lesson.
2. List the characteristics of a lesson.
3. Match terms and definitions used in lesson planning.
4. Plan an information lesson according to Herbert's four step plan.
5. Plan a manipulative skill development lesson according to herbert's four-step plan.

## III. ASSIGNMENTS

A. Read Chapters 5 and 6 in text.

B. Read the asterisked references first, then others as you think time permits.

C. Be prepared to make comments during class discussion regarding the study questions.

D. Prepare a 15 to 20 minute informational lesson plan according to Herbert's four-step plan. Select a subject from your teaching area.

E. Prepare a 20 to 30 minute manipulative skill development lesson plan according to Herbert's four-step plan. Select a skill from your teaching area.

## IV. REFERENCES

References 1*, Chapters 5 and 6; Reference 2*, Chapters 2, 3, 4 and 5; Reference 9, Chapters 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 16; Reference 14*, Chapters 2, 3 and 4.

## V. STUDY QUESTIONS

A. All questions at the end of Chapters 5 and 6 of the text.

B. All problems and projects at the end of Chapter 3, Reference 14*.

## UNIT V

## PRACTICE TEACHING

Instruct--to communicate knowledge.

I prefer the errors of enthusiasm to the indifference of wisdom. --Anatale France

Some had rather guess at much, than take the pains to learn.
--Danish Proverb

What you don't know won't hurt you but what you don't know won't help you much either. -- Don Bernnett

### I. INTRODUCTION

Your responsibility as a Vocational Industrial teacher is to help the students to learn. It is your job to provide the student every opportunity to learn a specific skill and to apply the principles and concepts applicable to that skill. One of the most important aspects of this educational process consists of providing the student with concise, explicit, and definite explanations and directions as to the best way to perform or approach the learning activities associated with the course. You are not a "funnel filler" who pours information into the students mind, but rather a guide and resource person for student action. When ideas are expressed as action, problem solving, or applied as manipulative skills in performance, they immediately become meaningful to the learner. It is this concept that you should keep in mind when developing your presentation and explanations.

After the content of a lesson has been decided upon, you should begin to plan in some detail just how you can best help the learner to master it. Although methods and materials will vary for each lesson, the Herbartian four-step plan of presentation is a well-tried plan. For those with limited teaching experience, this simple structure can be very helpful, both in planning and executing the instruction. It assures orderly teaching and systematic learning. As the teacher gains experience, the four-steps of this plan, although essential in every lesson in some form, may be used with greater freedom and less formality.

### II. OBJECTIVES

A. GENERAL - Use the Herbartian four-step teaching plan for presenting informational and skill developmental lessons.

B. Specific:

1. Learners will be able to follow Herberts four-step plan in presenting an informational lesson.
2. Learners will be able to follow Herberts four-step plan in presenting a skill developmental lesson.

## III. ASSIGNMENT

A. Read Chapters 10 in the text.

B. Read the asterisked references first, then the others as you think time permits.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

Reference 1*, Chapter 10; Reference 14*, Chapter 3.

## V. STUDY QUESTIONS

A. All questions at the end of Chapter 10 of the text.

B. All problems and projects at the end of Chapter 3, Reference 14*.

## UNIT VII

## PRACTICE TEACHING

Practice -- To do repeatedly in order to learn or become proficient.

The wise know too well their weaknesses to asseme infallibility; and he who knows most, knows best how little he know. --Thomas Jefferson

Knowledge comes by taking things apart. But wisdom comes by putting things together. --John A. Morrison

### I. INTRODUCTION

The application step in the teaching-learning process is by far the most important step to the learner. This is the stage in the teaching process which provides the opportunity for learning by doing. The learner attempts to apply that which has been demonstrated to him by the teacher. Up to this point, the learner has observed skills being performed by the teacher or has received instruction on how to perform the skill. In the application step the learner now attempts to apply the information previously received to the formation of judgements necessary to the mastery over the skills which is the objective of the lesson.

The application step presents the first opportunity for participation by self-performance. He now reverts from a passive participant to an active participant, and the teacher, although by no means retiring from the situation, is no longer the focal point of the learners attention.

### II. OBJECTIVES

A. General: To provide the learner with the opportunity to apply information and knowledge of teaching and learning psychology to specific informational and skill developmental lesson presentations.

B. Present an informational lesson.

C. Present a skill developmental lesson.

(NOTE: When possible these should be video taped then played back to the student. The instructor and the remainder of the class should critique the strengths and weaknesses of the student who made the presentation.)

### III. ASSIGNMENTS

A. Be prepared to make some comments during class discussion regarding the informational and skill developmental lesson presentations.

### IV. REFERENCES

Class hand-outs on presentation ratings.

## V. STUDY QUESTIONS

Be prepared to complete the final course evaluation. Review all previous test questions!

# BIBLIOGRAPHY

EXT 1. Miller, W. R. and Rose, Homer Co., The Instructor and His Job, American Technical Society, Chicago, Illinois, 1975.

2. Baird, Ronald Jr., Contemporary Industrial Teaching, The Goodhear-Willcox Co., Inc. South Holland, Illinois, 1972.

3. Bigge, Morris L., Learning Theories for Teachers, Second Edition, Harper and Rowe, New York, 1971.

4. Bittel, Lester R., What Every Supervisor Should Know, Second Edition, McGraw-Hill Book Company, New York, 1968.

5. Bloom, Benjamin S., Taxonomy of Educational Objectives, Handbook I, 18th Printing, David McKay Company, Inc., New York, 1974.

6. Boyd, Henry Bode, How We Learn, D. C. Heath and Company, Boston, 1940.

7. Brydle, John R., Technician Training, Brydle Associates, Princeton, N. J., 1971.

8. Cenci, Louis, Skill Training for the Job, Pittman Publishing Corporation, New York, 1966.

9. Gichino, J. W. and G. Allington, Ralph O., Course Construction in Industrial Arts, Vocational and Technical Education, American Technical Society, Chicago, Illinois, 1967.

10. Hass, Kenneth B. and Erving, Claude H., Tested Training Techniques, Prentice-Hall Inc., 1950.

11. Frymer, Jack R., The Nature of Educational Methods, Charles Merrill Books, Inc., Columbus, Ohio, 1965.

12. Hilgard, Ernest R. and Bowe, Gordon H. Theories of Learning. Prentice-Hall, Inc., Inglewood Cliffs, N. J., 1975.

13. Johnson, Stuart R., and Johnson, Rita B., Developing Individualized Instructional Material, Westinghouse Learning Press, First Edition, Fifth Printing, 1972.

14. Leighbody, Gerald B. and Kidel, Donald M., Methods of Teaching Shop and Technical Subjects, Delmor Publishers, Albany, New York, 1966.

15. Mager, Robert F. and Beach, Kenneth M., Developing Vocational Instruction Fearon Publishers, Belmont, California, 1967.

16. Mager, Robert F., Goal Analysis, Fearon Publishers, Belmont, California, 1972.

17. Mager, Robert F., Measuring Instructional Intent, Fearon Publishers, Belmont, California, 1973.

18. Mager, Robert F., Preparing Instructional Objectives, Fearon Publishers, Belmont, California, 1962.

19. Michaels, William J., and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Company, New York, 1950.

20. Proctor, James O., Techniques Notes Tips for Teachers, Delmor Publishers, Albany, New York, 1968.

21. Sartin, Aaron O., and Barker, Alton, W., The Supervisor and His Job, McGraw-Hill Book Company, New York, 1965.

22. Silvius, G. Harold and Curry, Estelle H., Teaching Successfully in Industrial Education, Second Edition, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1967.

23. Vocationa-Technical Terminology, American Vocational Association, Washington, D. C., 1971.

24. Williams, William A., Accident Prevention Manual for Shop Teachers, American Technical Society, Chicago, Illinois, 1963.

Appendix H

# THE UNIVERSITY OF CENTRAL ARKANSAS
# INDUSTRIAL EDUCATION DEPARTMENT

# PLANNING FOR INSTRUCTION IN VOCATIONAL INDUSTRIAL SUBJECTS

VOCATIONAL-INDUSTRIAL EDUCATION 2303

Three Semester Hours
Credit

SYLLABUS FOR THE COURSE

January 1977

VIE 2303

THE UNIVERSITY OF CENTRAL ARKANSAS
Conway, Arkansas

Vocational-Industrial E
Education 2303

# PLANNING FOR INSTRUCTION IN VOCATIONAL INDUSTRIAL SUBJECTS

## Content of the Course:

Unit I. Introduction: Scope and Content of a Course of Study

Unit II. Objectives, Their Derivation and Use

Unit III. Instruction Units, Their Selection and Arrangement

Unit IV. Job Assignments, Their Selection and Organization

Unit V. Informational Assignments, Their Preparation and Use

Unit VI. Selecting Textbooks and References

Unit VII. Evaluative Devices, Their Construction and Use

Unit VIII. Outline of the Teaching Plan

Unit IX. Course Evaluation

## INTRODUCTORY STATEMENT

Vocational-Industrial Education 2303, Planning for Instruction in Vocational-Industrial Subjects, is designed to provide the teacher of Vocational-Industrial Education an opportunity to gain the knowledge of the problems and an understanding of the techniques and procedures in the selection and organization of both information and skill development subject matter for instructional purposes.

## I. COURSE ORGANIZATION

A. This course is organized into nine units of instruction which are outlined in separate assignment sheets in this syllabus. Each unit contains an introduction, unit objectives, specific assignments, references, and a group of statements and/or questions to be dealt with according to each set of instructions.

B. The assignment will specify exactly what you are expected to do including the readings, investigations, and reports required in each unit.

C. The statements and questions are intended to guide your reading and to present problems which should help you to interpret the facts, evaluate ideas, and formulate judgements.

D. Comprehensive evaluations will be made:

1. At the conclusion of each unit
2. After the practice teaching assignment
3. At the conclusion of the course

## II. WRITTEN ASSIGNMENTS

A. The assignments specified in each unit should be prepared in a careful and scholarly manner. Unless your writing is perfectly legible, your written work should be typed. The maximum length of each report will be specified in terms of double-spaced typed material.

B. It is expected that references should be used in the preparation of assignments. In all cases where direct quotations are used, give footnote references, including in sequential order:

1. Author
2. Exact title
3. Edition and volume
4. Name of publisher
5. Location of publisher
6. Date of publication
7. Page or chapter of quotation

C. Where no direct quotations are given in a report, simply list a bibliography of the materials utilized in preparing the assignment.

D. Attach a cover page to each written assignment providing the following information:

1. Your name
2. Course number and title
3. Unit number
4. Exact title of your paper
   (not the title of the unit)
5. Date paper was prepared

E. The series of unit papers required will culminate in a comprehensive course of study for a particular course. The specific instructions for the preparation of each unit paper will be found in the assignment which accompanies the unit. The paper will be due immediately following the completion of the unit in which the assignment was mde unless some other time is specified by the instructor. These unit papers will be marked and returned to you in order that you may retain them until the end of the term, at which time a numbered table of contents and title page should be added and the entire contents placed in a notebook size pressboard folder for collection by the instructor. These copies will not be returned, therefore, you should prepare a carbon copy for your personal file.

## III. COURSE OBJECTIVES

A. General: Provide the student an opportunity to learn the principles and practices of planning for instruction by developing a pilot model of a complete course of study as required for instructing Vocational-Industrial subjects.

B. Specific:

1. To develop an awareness of the need for adequate and well organized instructional materials.
2. To develop an awareness of the bases upon which course content is selected.
3. To develop the ability to organize subject matter into a course of study from which teaching may be done more effectively.
4. To develop a favorable attitude toward professional growth and cooperative activity in the development, production, distribution, and utilization of instructional materials.
5. To develop the ability to prepare instructional materials for the teaching of both manipulative and informational instruction units.
6. To develop the ability to prepare evaluative devices for ascertaining the degree of attainment in terms of course objectives.
7. To become acquainted with the factors that influence the effectiveness of instructional materials to the end that better selections may be made.
8. To acquire a degree of competency in the organization of specific content to be presented during a given period of time.

## IV. BASIS OF EVALUATION

A. Objective Tests

| | | |
|---|---|---|
| 1. Unit tests | 20% | |
| 2. Final test | 20% | |
| | TOTAL | 40% |

B. Unit Reports

1. Quality 05%
2. Punctuality 05%

TOTAL 10%

C. Practice Teaching Assignment

1. Lesson Plans
   a. Informational less 10%
   b. Skill development lesson 10%
2. Presentation
   a. Information lesson 15%
   b. Skill development lesson 15%

TOTAL 50%

GRAND TOTAL 100%

## UNIT I
## INTRODUCTION: SCOPE AND CONTENT OF A COURSE OF STUDY

### I. INTRODUCTION

Two important duties of the Vocational-Industrial instructor are:

1. Laboratory and Shop organization and management
2. The construction and use of the course of study

These duties are closely interrelated; laboratory and shop equipment, lay-out, and organization determines course possibilities; and the nature of the materials and supplies that will be needed. Also, there is almost a point-to-point relationship between course organization and methods of instruction. Viewed in this light, the course of study is a guide to the most intelligent use of all laboratory and shop facilities for securing the maximum student growth.

Approximately 93% of shop instructors, according to recent studies, must develop their own courses of study. Their ability to successfully do this work, and to use the results, goes farther than anything else to diminish discipline problems, secure student interest and effort, and establish a good personal reputation as a teacher in the eyes of colleagues and of the administration.

The techniques and "know-how" for building effective Vocational-Industrial courses have been developed during the past half century in response to one of the most difficult problems of subject-matter organization of any activity in the curriculum. It is only through the understanding and application of these techniques that Laboratory and Shop courses of the first quality can be constructed, and the techniques further improved. These techniques are involved in several of the following essential steps of course construction:

1. Determining what to teach.
2. Selection of jobs or vehicle of instruction.
3. Preparation of written instructions.
4. Evaluation of student achievement.

### II. OBJECTIVES

A. General: Develop a clear insight into the general significance of course construction in Vocational-Industrial Education, an understanding of the problem of course construction, and a comprehensive grasp of the major steps involved.

B. Specific.

## III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Select the title for your course of study.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961, Chapter I, II, and III.

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, Chapter XIII.

Fryklund, Verne C., Analysis Techniques for Instructors, The Bruce Publishing Company, Milwaukee, Wisconsin, 1956, Chapter XI.

Friese, John F., Course Making in Industrial Education, The Manual Arts Press, Peoria, Illinois, 1946, Chapter II and IV.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pennsylvania, 1954, Chapter I and pp. 101-104.

## V. STUDY QUESTIONS

A. What is meant by the following terms?

1. Industrial Education
2. Industrial Arts
3. Vocational-Industrial Education
4. Vocational Education
5. Day-Trade School
6. Part-time school or class
7. Evening school or class
8. Vocational-technical education
9. Related subject
10. Subject matter

B. What is a course of study? For whom is it prepared? What purposes does it serve? What should it include? How does it differ from a curriculum?

C. What steps are involved in working out a course of study?

D. Define the following terms:

1. Curriculum
2. Subject
3. Course
4. Course of study

E. Why is a course of study desirable?

F. What are three of the approaches to curriculum construction?

G. What different types of courses of study are used in industrial education? What are the advantages and limitations of each?

H. When should courses of study by revised? How should this be done?

I. What is the present status of courses of study in industrial education? How does this compare with other subject-matter fields?

J. Aside from improved instruction, what values should accrue to the teacher through working out courses of study?

## UNIT II

## OBJECTIVES, THEIR DERIVATION AND USE

### I. INTRODUCTION

Subject matter in education is not an end in itself; it is a necessary means to an end. That end is the attainment of the objectives for which the school, the subject, or the course exists.

Therefore, in the selection of subject matter for any course of study, it is imperative that we first determine our objectives. Objectives in education serve three purposes: (1) as goals to be attained, (2) as guides in the selection of content, organization and procedure, and (3) as standards for the evaluation of attainment. But objectives are not something that can be pulled out of a hat or jerked from the sky. Their determination involves a careful consideration of (1) the nature and needs of society, past present, and future, (2) the character and needs of the individuals to be educated, and (3) the best there is in educational theory and practice.

### II. OBJECTIVES

A. General: To examine the three factors involved in determining objectives, at a clear-cut and concise statement of the objectives of Vocational-Industries education in general.

B. Specific:

1. Determine objectives of Industrial Arts and Vocational-Industrial Education in:
   a. Elementary School
   b. Junior High School
   c. High School
   d. Post High School
2. Determine and write general and specific objectives for your specific course of study.

### III. ASSIGNMENT

A. Read the asterisked references then others as you think time permits.

B. Develop a tentative course lay-out to implement course title. Include an introductory statement explaining the nature and scope of the course; its grade placement, its prerequistes (if any), its length and a statement of school philosophy.

### IV. REFERENCES

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, Chapter XI.

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961 Chapters V, VI, and VII.

Industrial Arts in Education: Definition, Unique Contributions, Emphasis by Levels, AVA, Washington, D.C., pp. 1-8.

Wilber, Gordon O., *Industrial Arts in General Education*, International Textbook Company, Scranton, Pa., 1954, Chapter III.

## V. STUDY QUESTIONS

A. What is an educational objective: What types of educational objectives are there?

B. What three factors should be considered in formulating over-all objectives of education? Objectives for a particular school, department or course?

C. With the advent of World War II what new aspect did American life take on with increasing emphasis? What are the educational implications of this involvement?

D. What changes is the future likely to bring which will influence the school curriculum?

E. What are the *characteristics* and *educational* needs of growing children? Of Adults?

F. What have we learned about the human mind, the learning process, and educational methodology that should influence the school curriculum?

G. What are the broad, over-all objectives of secondary education as stated in the Cardinal-Principles, by the Educational Policies Commission, by Wilber?

H. What are the commonly accepted objectives of industrial arts in the elementary school? (Bonser) in the secondary school. Which objectives are unique for industrial education? Are they all of the same importance?

I. What are the objectives of pre-employment vocational-industries education? Of in-service vocational-industrial education?

J. How should objectives be stated?

K. What three purposes should educational objectives serve?

## UNIT III

## INSTRUCTION UNITS, THEIR SELECTION AND ARRANGEMENT

### I. INTRODUCTION

Having determined his objectives, the teacher's next step in the preparation of a course of study is the selection and arrangement of teaching content. This involves an analysis of the occupation, activity, or subject with which the course is concerned and then the selection and to the time and teaching facilities available.

Several forms of analysis are used in making courses of study for industrial education, such as occupational analysis, job analysis, activity analysis, and subject matter analysis.

Occupational analysis is a technique by means of which the essential elements of an occupation, trade, or payroll job are identified and listed for instructional purposes. This analysis reveals (1) manipulative elements of what the worker must be able to do--the skills involves, (2) informational elements or what the worker must know--the technical (3) the required personality traits--what the worker must be from a personal stand point.

Job analysis, on the other hand, is a technique by means of which the various operations of a production job are identified and listed. This analysis reveals directly the manipulative operations and indirectly the technical information involved in doing the job. In industrial education it is used primarily in the selection and organization of teaching projects, rather than in the selection of teaching content.

Vocational Technical courses involve subject matter experiences taken from crafts or industries. In selecting content for these courses, an activity analysis is made whereby the basic manipulative and informational elements are identified and listed as desireable instruction units. From the analysis, those units which lend themselves best to school shop conditions, which contribute most directly to the objectives to be attained, and which are appropriate to age and ability of the learner are chosen.

In trade schools separate courses are often given in related subjects, such as science, mathematics, drawing, English, occupational health and safety, and employer-employee relations. In selecting teaching content for such courses, the procedure is to identify and list those elements which relate to and are necessary in one or more occupations, and then arrange them to be taught from the occupational point of view. This analysis is properly designated as subject matter analysis.

## II. OBJECTIVES

A. General: Provide on opportunity for the learner to gain knowledge and skill in using the techniques of analysis, the factors involves in the selection of teaching content, and the arrangement of different types of instruction units for teaching purposes.

B. Specifics

1. Analyze a specific operation for each element, knowledge.
2. Select the teaching content from the analysis completed in item 1.
3. Organize the teaching contrast into a unit of instruction.
4. Organize the unit into individual lessons.

## III. ASSIGNMENT

A. Read the asterisked references first, then others as you think time permits.

B. List the objectives for your course. Both general and specific.

C. Prepare a list of the instruction units to be taught, properly grouped and arranged. (Course outline form)

D. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961, Chapters VIII, IX, XI, and XII.

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, pp. 276-282.

Fryklund, Verne Co., Analysis Techniques for Instructors, Bruce Publishing Company, Milwaukee, Wisconsin, 1956, Chapters I-IX.

Improving Instruction in the Industrial Arts, American Vocational Association, Inc., Washington, D.C., 1953, pp. 13-40.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pa., 1954, Chapter V.

## V. STUDY QUESTIONS

A. Approximately 50 per cent of the workers of America are engaged in industrial and service occupations. There are thousands of these occupations. Some of them require no training whatever, others require brief on-the-job training, and still fewer require specialized pre-employment training. Obviously, then, the school cannot and should not attempt to train people for all occupations. In what industrial occupations should the school offer pre-employment training? In-service training? What factors would determine this?

B. No school, regardless of its plan, equipment, and staff, can include all phases of industry in its industrial arts program. What, then, should be included in a well-rounded program of industrial arts? What factors will determine this? (Ericson, p.276)

C. What is a custom trade? A service trade? A skilled operator? An unskilled worker? (Fryklund, p. 70; p. 95)

D. What does it mean to analyze an occupation? A job? An activity? A subject? What do such analysis reveal?

E. What is a job description? A job specification? A job classification? For what purposes are these used? (Fryklund, pp. 28-35)

F. How are the operations of a trade (or occupation) related to the jobs of that trade (or occupation)? What four types of operations are involved in mechanical trades? (Fryklund, pp. 38-45)

G. What use is made of jobs in teaching industrial subjects?

H. Into what size elements should an occupation be analyzed for instruction purposes? What factors will determine this?

I. How should manipulative instruction units (operations) be expressed or stated in making an analysis? (Fryklund, pp. 45-50)

J. What is the difference between "related information" and "related subject", as the terms are used in industrial education? (Fryklund, pp.55-58)

K. What three kinds of related information topics are involved in learning a trade? How should these be handled in trade teaching? (Fryklund, pp. 58-63)

L. What is meant by blocking out a trade or occupation? What is its purpose? What determines the block? What is a block base? (Fryklund, pp. 75-79)

M. What is meant by the "instructional steps" in an operation? Of what importance are these in teaching beginning operations? Cummulative operations? (Fryklund, Chapter 8)

N. How should informational learning units be stated in analyzing an occupation, or activity, or subject? (Fryklund, p. 110)

O. What should determine the order or sequence of instruction units in arranging teaching content? (Fryklund, pp. 84-89)

P. Why do we group manipulative units and informational units separately? What determines the grouping and sequence of instruction units for courses of study for coop classes? What should be done with the character traits essential in an occupation? (Giachino and Gallington, Chapter II)

Q. What is a checking level in a trade analysis? Of what use are they in trade teaching? (Fryklund, p. 90)

R. What is a progress chart? What are its essential features? How is it used in trade teaching? In industrial arts? (Fryklund, p. 92-97)

## UNIT IV

## JOB-ASSIGNMENTS, THEIR SELECTION AND ORGANIZATION

### I. INTRODUCTION

Having selected and arranged the instruction units to be included in a course of study, the next step is to organize the units with appropriate instructional materials for teaching purposes.

In the shop or laboratory, manipulative instruction units can best be taught through a series of exercises, projects or production jobs, the doing of which involves their use. Likewise, many informational units may best be taught in connection with the projects where planning and the application of factual materials are involved. On the other hand, other informational units may be more advantageously taught as separate assignments.

In the coop program the manipulative instruction units (called job skills and procedures) are taught largely by the employer in connection with production jobs just as they arise and form a part of the student's daily work as he progresses through the various phases of the occupation. Many informational units are also taught on the job, but the coordinator is primarily responsible for this phase of instruction. He may also "farm out" the student-worker to some technical department of the school where supplementary job skills and procedures will be taught.

Related subjects teachers in part-time and evening trade extension classes may provide supplementary instruction in job skill and procedures. In most cases, however, their responsibility will be confined to teaching informational content supplementary to the daily employment of young and adult workers.

### II. OBJECTIVES

A. General: The learner will have the opportunity to select and organize activities through which manipulative units of instruction can be taught in the school.

B. Specific

1. Analyze a specific operation for each elementary skill development.
2. Select the teaching content from the analysis made in item one.
3. Organize the teaching elements into a unit of instruction.
4. Organize the unit into individual lessons.

## III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Select and list six or more projects, jobs or problems that are suitable for teaching the manipulative instruction units in your course of study. (pp. 136-138 text)

C. Prepare operation sheets for six of your jobs or problems.

D. Select two instruction manuals or textbooks which are suitable for use in your course of study and give complete bibliography for each.

E. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961, Chapter X.

Selvidge and Fryklund, Principles of Trade and Industrial Teaching, Charles A. Bennett Company, Inc., Peoria, Illinois, 1946, Chapters V & VI.

Silvius and Bohn, Organizing Course Materials for Industrial Education, 1961, pp. 273-280.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pa., 1954, pp. 91-96 and Chapter XI.

## V. STUDY QUESTIONS

A. What is a manipulative skill? How is it learned? What distinguishes the skilled person?

B. What is meant by job procedure? How is it learned? Of what importance is it in production work? In industrial education?

C. What is a project or instruction job? What factors should determine the selection of shop projects? Of what use is job analysis in this connection?

D. What is meant by "core" or "standard" jobs or projects? Under what conditions would you use them?

E. What is meant by "Limited elective" projects? Under what conditions would you use them?

F. What is a "free elective" project? Under what conditions can it be used advantageously?

G. Ideally, what four types of student activity are involved in good shop projects? How will this work out with core projects? With limited elective projects? With free elective projects? With students of high and low ability?

H. Under what conditions should the shop teacher use individual projects? Group projects? Production jobs or projects? Repair jobs? Exercises?

I. What, in addition to the name of a project, is necessary to describe if for production purposes? For instruction purposes? (Wilber, p. 164)

J. What is an operation sheet? What does it contain? What are its advantages and limitations? Where may such sheets be found?

K. When should the teacher prepare his own operation sheets? What books, in the field for which you are outlining a course, contain satisfactory operation sheets?

L. What problems are involved in using instruction materials of the type you are preparing in this unit? How may these be overcome? (Selvidge and Fryklund, p. 120; Wilber p. 176)

## UNIT V

## INFORMATIONAL ASSIGNMENTS, THEIR PREPARATION AND USE

### I. INTRODUCTION

In Industrial Education, ideally three closely related yet different types of learning take place. First, there is the development of manipulative skills and job procedures, the learning of which involves habit formation. Second, there is the informational content which involves mastery of facts, insights and understanding. Third, there is the development of personality traits and practice consistent with the interpretation placed on experience and practice consistent with the interpretation.

While many of the informational instruction units of a course of study may best be taught in connection with projects, drawing problems or production jobs, through oral and written instruction and through demonstrations, others may be more advantageously taught as separate assignments. In"related subjects" the content is chiefly, if not wholly, informational in character. Often such courses must be presented so as to be applicable to a number of different occupations or industries. In order to teach informational content effectively, the teacher must prepare his instructional materials just as carefully as he does in the teaching of manipulative content. Informational assignments are a means to this end.

Informational assignments may be of two types: on a short assignment dealing with factual material closely related to the job or project on which the student is working and which can be handed to him during the regular shop or laboratory period; the other a more inclusive and longer assignment dealing with factual material not necessarily related to a particular project or job and which can be worked out during his study period or at home.

### II. OBJECTIVES

A. General: The learner will prepare an informational assignment for use in related subjects classroom.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Select and list at least three textbooks or manuals containing informational content suitable for teaching the informational instruction units in your course or study, giving complete bibliographical data for each.

C. Make a list (by sheet number and title) of the informational assignments you propose to use in teaching the informational content of your course of study, indicating the units (by number) to be covered in each.

D. Select six informational instruction units or groups of units from the list mentioned in B above and prepare "model" informational assignment sheet for each.

E. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961, Chapter XVII

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, Chapter VII.

Fryklund, Verne Co., Analysis Techniques for Instructors, The Bruce Publishing Company, Milwaukee, Wisconsin, 1956. Chapter XII.

Selvidge and Fryklund, Principles of Trade and Industrial Teaching, Charles A. Bennett Company, Inc., Peoria, Illinois, 1946, Chapter VIII.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Company, Scranton, Pa., 1954.

## V. STUDY QUESTIONS

A. How are informational background and planning related to efficiency in the performance of any activity? What other factors relate to human efficiency?

B. How is technical information related to manipulative skills in industrial activities and occupations? (Selvidge and Fryklund, p. 179)

C. What types of informational content must of necessity be taught along with manipulative skills? What type can best be taught separately?

D. By what different means may informational content be taught? What are the advantages and disadvantages of each?

E. In what ways do individuals differ significantly? How do these differences affect the teaching of informational content in the shop or in the related subjects classroom?

F. What relation is there between responsibility in learning and achievement? Upon who should the responsibility for learning be placed?

G. What is an informational assignment sheet? What items should it contain? What is the purpose of each item?

H. How do assignment sheets aid in placing the responsibility for learning upon the student. What are their chief limitations?

I. How may informational assignment sheets best be duplicated? Should they be issued to students permanently or kept by the instructor?

J. How should informational assignments be used in a shop or drawing class? In a coop program? In an evening trade extension class?

K. By what means may we check achievement in teaching informational content or related subjects?

L.. Define supervised study as a method of instruction.

## UNIT VI

## SELECTING TEXTBOOKS AND REFERENCES

### I. INTRODUCTION

The textbook is a valuable tool in the teaching-learning process, and should be selected with care. The textbook should contain certain qualities which make it useful to both the teacher and the learner as they deal with given areas and work toward the attainment of stated educational objectives.

There are teachers in industrial arts field who minimize the importance of textbooks. Some feel that textbooks reduce the efficiency of the manipulative processes upon which industrial arts is based. Thankfully, this practice is not universal and in many effective industrial arts programs the textbook is an integral part of the learning process. Industrial arts involves more than just the acquistion of manipulative skills. Textbooks can serve as a medium of enrichment since pupils generally like to have a textbook for the course and are receptive to their use. Textbooks are intended for the use of the individual students and furnish definite basic information regarding the subject area to be studied.

Reference books are essential in shop work to supplement the basic textbook. Their place is generally in the school library, the shop library, or the planning area of the shop. They should be available for student and teacher use and they should be selected just as carefully as textbooks. They can be of value in training students to do elementary research problem solving, and in the stimulation of reading interest.

### II. OBJECTIVES

The learner will select a series of reference materials to be used in a specific shop or laboratory.

### III. ASSIGNMENT

A. Read the asterisked references first then others as your time permits.

B. For one of the books previously selected, outline the desireable and undesirable features of the text giving special notice to the illustrations and techniques designed to increase its readability.

C. Be prepared to discuss the guide phrases and questions which follow.

## IV. REFERENCES

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education. Chicago, American Technical Society, 1961, pp. 229-231)

Ericson, E. E. and Seefeld, Teaching the Industrial Arts, Peoria, Illinois, Charles A. Bennett Co., 1960, pp. 148-154.

## V. STUDY QUESTIONS

A. What specific information must a textbook cover before it is acceptable?

B. How do textbooks and references differ?

C. What objections might be raised concerning the use of a textbook in secondary school industrial education classes?

D. What criteria must be considered in textbook selection?

E. What has been the trend with regard to the quality of industrial education textbooks?

F. How can a teacher keep himself informed regarding new publications in the field?

G. What is textbook obsolescence?

H. How does student reading level in industrial arts compare with readability level of industrial arts textbooks?

## UNIT VII

## EVALUATIVE DEVICES, THEIR CONSTRUCTION AND USE

### I. INTRODUCTION

One of the most effective incentives to increased effort and improvement is knowledge of one's progress and attainment in comparison to that of others. Effective teaching, likewise, demands a knowledge on the part of the teacher of the progress and achievement of his students. Finally, the assignment of marks and the promotion of students necessitates the measurement of achievement.

While a few standardized trade and subject matter tests have been developed for use in industrial education, these are by no means adequate for purposes of measurement and evaluation in the variety of courses offered. The teacher, therefore, is confronted with the necessity of preparing his own tests, progress charts, rating scales and the like.

### II. OBJECTIVES

A. General: The learner will have the opportunity to study the problems and procedures involved in the construction of tests, scales and progress charts for use in teaching industrial subjects.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Outline a plan for measuring achievement and assigning marks in course.

C. Prepare an objective type test, including directions for at least six different types of questions for the six informational assignments in Unit V.

D. Prepare an evaluation device for each of the six operations in Unit IV.

E. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

Michaels and Karnes, Measuring Educational Achievement, McGraw-Hill Book Co., New York, 1950, Chapters III, IV, V, and pp. 160-165; 195-200; 220-223; 244-257.

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, pp. 201-220.

VIE 2303

Wood, Dorothy Adkins, Text Constructions, Charles A. Merrill Book Inc., Columbus, Ohio., 1961.

Selvidge and Fryklund, Principles of Trade and Industrial Teaching, Charles A. Bennett Co., Inc., Peoria, Illinois, 1946, Chapter XX.

Silvius and Bohn, Organizing Course Materials, 1961, Chapter XI

## UNIT VII

## EVALUATIVE DEVICES, THEIR CONSTRUCTION AND USE

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One of the most effective incentives to increased effort and improvement is knowledge of one's progress and attainment in comparison to that of others. Effective teaching, likewise, demands a knowledge on the part of the teacher of the progress and achievement of his students. Finally, the assignment of marks and the promotion of students necessitates the measurement of achievement.

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### II. OBJECTIVES

A. General: The learner will have the opportunity to study the problems and procedures involved in the construction of tests, scales and progress charts for use in teaching industrial subjects.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Outline a plan for measuring achievement and assigning marks in course.

C. Prepare an objective type test, including directions for at least six different types of questions for the six informational assignments in Unit V.

D. Prepare an evaluation device for each of the six operations in Unit IV.

E. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

Michaels and Karnes, Measuring Educational Achievement, McGraw-Hill Book Co., New York, 1950, Chapters III, IV, V, and pp. 160-165; 195-200; 220-223; 244-257.

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, pp. 201-220.

Wood, Dorothy Adkins, Text Constructions, Charles A. Merrill Book Inc., Columbus, Ohio., 1961.

Selvidge and Fryklund, Principles of Trade and Industrial Teaching, Charles A. Bennett Co., Inc., Peoria, Illinois, 1946, Chapter XX.

Silvius and Bohn, Organizing Course Materials, 1961, Chapter XI

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Co., Scranton, Pa., 1954, Chapter XIX

## V. STUDY QUESTIONS

A. For what different purposes do we measure achievement in teaching? What relation is there between a knowledge of achievement and effort exerted?

B. What different things can and should be measured in teaching industrial subjects? What "blind spots" have been commonly ignored in measuring achievement? (michaels and Karnes, p. 89; Wilber, p.337)

C. What place should objectives play in the measurement and evaluation of achievement? Skills? Information? Attitudes and personality traits? Effort? Progress?

D. What different types of evaluative, checking and testing devices may be used effectively by teachers of industrial subjects? To what extent are these being uses?

E. What constitutues a good text? What different types of test questions. lend themselves for use in industrial education? (Michaels and Karnes, p. 103; Selvidge and Fryklund, p. 362)

F. How should one go about the construction of test? (Selvidge and Fryklund, p. 368; Ericson, p. 216; Wilber, p. 338; Michaels and Karnes, pp. 126-149)

G. What different standardized tests and scales are available for use by teachers of industrial subjects? How often should a teacher measure achievement and progress in teaching? What conditions should prevail for the effective measurement of achievement?

H. How does the problem of measuring achievement in a single course of study differ from that of evaluating a program of industrial education?

I. What criteria are used in evaluating industrial arts programs? Trade and industrial programs?

## UNIT VIII

## OUTLINE OF TEACHING PLAN

### I. INTRODUCTION

A course of study, containing objectives, instruction units, teaching vehicles, evaluative devices, and the like, is designed primarily as as guide for the teacher. Its purpose is to make teaching more orderly, more effective and easier, and to facilitate learning on the part of the student. The heart of a course of study is its content and the learning activities and devices incorporated therein.

In using a course of study it is convenient for the teacher to have, on one sheet, in outline form, a teaching plan which contains such items as the following:

1. major divisions of the course
2. required projects together with sources where elective
3. demonstrations to be given, with coded references to written materials illustration and explaining the operations to be demonstrated
4. topics for class discussion and special reports
5. informational assignments to be made
6. other activities and teaching devices to be used, such as films, field trips, outside speakers
7. notes indicating the time and nature of any achievement tests to be given during and at the end of the course

### II. OBJECTIVES

A. General: The learner shall outline a teaching plan for the course you are preparing, and discuss the use of each item in the teaching process.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Prepare a teaching plan for your course of study.

C. Check your teaching plan against your list of instruction units to make sure that all of them have been included.

D. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCE

Giachino and Gallington, Course Construction in Industrial Arts and Vocational Education, American Technical Society, Chicago, Illinois, 1961, Chapters XIV and XV.

Ericson and Seefeld, Teaching the Industrial Arts, Charles A. Bennett Company, Inc., Peoria, Illinois, 1960, Chapter V.

Educators Guide to Free Films, Educators Progress Service, 1964, Randolph, Wisconsin.

Selvidge and Fryklund, Principles of Trade and Industrial Teaching, Charles A. Bennett, Bennett Company, Inc., Peoria, Illinois, 1946. pp. 142-154.

Wilber, Gordon O., Industrial Arts In General Education, International Textbook Company, Scranton, Pa., 1954, pp. 377-394.

## V. STUDY QUESTIONS

A. What are the steps in the Selvidge plan of shop teaching? What is the purpose of each? What criticism would you make of the plan? (Selvidge and Fryklund, p. 142)

B. What different types of books are available as aids in teaching industrial subjects? How may each type be used? What are the arguments for and against the use of books in shop teaching?

C. What publishing companies produce books for use in industrial education? Where are these companies located?

D. What magazines are available as sources for projects and technical information for use in teaching industrial subjects?

E. What motion pictures and film strips are available as aids in teaching industrial subjects? Your particular course? Where may they be obtained?

F. What other teaching aids and devices are available to the teacher of industrial subjects? What are their advantages and disadvantages?

G. How may books, films and other devices be incorporated in the teaching plans? How many should be used?

# THE UNIVERSITY OF CENTRAL ARKANSAS
# INDUSTRIAL EDUCATION DEPARTMENT

# ORGANIZATION, MANAGEMENT AND SAFETY IN VOCATIONAL-INDUSTRIAL SUBJECTS

## VOCATIONAL-INDUSTRIAL EDUCATION 2302

Three Semester Hours
Credit

## SYLLABUS FOR THE COURSE

January 1977

## SOMETHING TO THINK ABOUT

"A tool is but the extension of a man's hand, and a machine is a complex tool. And he that invents a machine augments the power and the well-being of mankind." --Henry Ward Beecher

"Man is a tool-using animal. Weak in himself, and of small stature, he stands on a basis, at most for the flattest-soled, of some half-square foot, insecurely enough; has to straddle out his legs, lest the very wind supplant him. Feeblest of bipeds! Three quintals are a crushing load for him; the steer of the meadow tosses him aloft, like a waste rag. Nevertheless he can use TOOLS, can devise TOOLS: with those the granite mountain melts into light dust before him; he kneads glowing iron, as if it were soft paste; seas are his smooth highway, winds and fire his unwearing steeds. Nowhere do you find him without TOOLS: without TOOLS he is nothing, with TOOLS he is all." --Thomas Carlyle

"We are students of words; we are shut up in schools and colleges and recitation rooms from ten to fifteen years, and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands, or our legs, or our eyes, or our arms ... In a hundred high schools and colleges, this warfare against common sense still goes on." --Ralph Waldo Emerson

"We are always in these days endeavoring to separate intellect and manual labor; we want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen in the best sense. As it is, we make both ungentle, the one envying, the other despising his brother; and the mass of society is made up of morbid thinkers and miserable workers." --John Ruskin

"Cease from grinding, ye women who toil at the mill; sleep late even if the crowing cocks announce the dawn. For Demeter has ordered the Nymphs to perform the work of your hands, and they, leaping down on the top of the wheel, turn its axle which, with its revolving spokes, turns the heavy concave Nieyrian Millstones. We taste again the joys of the Primitive life, learning to feast on the products of Demeter without labor." ---Antipater of Thessalonica

VIE 2302

THE UNIVERSITY OF CENTRAL ARKANSAS
Conway, Arkansas

Vocation-Industrial Education
2302

## ORGANIZATION, MANAGEMENT, AND SAFETY IN VOCATIONAL INDUSTRIAL SUBJECTS

### Course Content

Part I: The Planning of School Shops/Laboratories

- A. Types of Industrial Education Shops/Laboratories
- B. Principles of School Shops/Laboratories
- C. Selection and Purchase of Tools and Equipment
- D. Selection and Purchase of Materials and Supplies

Part II: The Operation of School Shops/Laboratories

- A. Shop/Laboratory Records, Inventories, and Reports
- B. Maintenance and Shopkeeping
- C. Shop/Laboratory Safety Program
- D. Personnel Management and Discipline

## INTRODUCTORY STATEMENT

Vocational-Industrial Education 2302, Organization, Management and Safety in Vocational-Industrial subjects, is designed to provide the teacher of Vocational Industrial Education an opportunity to learn the techniques of organizaing and managing a school shop/laboratory to assure the most efficient learning in a safe environment for the Vocational-Industrial student.

### I. COURSE ORGANIZATION

A. This course is organized into two parts. The Planning of Schoold Shops/Laboratory with four units in each part. Each unit contains an introduction, unit objectives, specific assignments, references and a group of statements/question to be dealt with according to each set of instruction.

B. The assignment will specify exactly what you are expected to do i including the readings, investigations, and reports required in each unit.

C. The statements and questions are intended to guide your reading and to present problems which should help you to interpret the facts, evaluate ideas, and formulate judgements.

D. Comprehensive evaluations will be made:

1. At the conclusion of each unit
2. At the conclusion of the first part
3. At the conclusion of the second part

### II. WRITTEN ASSIGNMENTS

A. The assignments specified in each unit should be prepared in a careful and scholarly manner. Unless your writing is perfectly legible, your written work should be typed. The maximum length of each report will be specified in terms of double-spaced typed material.

B. It is expected that references should be used in the preparation of assignments. In all cases where direct quotations are used, give footnote references, including in sequential order:

1. Author
2. Exact title
3. Edition and volume
4. Name of publisher
5. Location of publisher
6. Date of publication
7. Page or chapter of quotation

C. Where no direct quotations are given in a report, simply list a bibliography of the materials utilized in preparing the assignment.

D. Attach a cover page to each written assignment providing the following information:

1. Your name
2. Course number and title
3. Unit number
4. Exact title of your paper (not the title of the unit)
5. Date paper was prepared

E. Staple the pages together in the upper left corner. Do not fold and do not use binders or folders!

## III. COURSE OBJECTIVES

A. To develop in the Trade and Industrial Teacher:

1. The ability to plan and organize for new shops and re-organize in existing shops, equipment, materials, supplies, schedules, records, and other teaching facilities in the shop and classroom for the most effective teaching and learning.

2. To develop knowledge and understanding of good principles of management in providing, directing, control and supervision of learning activities that will insure the most effective use of time spent in the shop and classroom.

3. To develop an appreciation of the importance of the use of a plan of organization and management that will provide for the development of essential skills, knowledge, and attitudes, and harmonious relations by reducing to a minimum discipline and other problems.

4. To develop a comprehensive system for maintaining data on student and industrial needs for effective placement and on procedures for securing valid information on students progress after entering employment.

TEXT: Modern School Shop Planning, 6th edition, Prakken Publication, Inc., Ann Arbor, Michigan, 1972.

## IV. BASIS OF EVALUATION

A. Objective Tests

| | | |
|---|---|---|
| 1. Unit | 20% | |
| 2. Final | 20% | |
| | TOTAL | 40% |

| | | |
|---|---|---|
| B. | Course Study | 60% |
| | GRAND TOTAL | 100% |

# PART I
# THE PLANNING OF SCHOOL SHOPS

## UNIT I

## TYPES OF INDUSTRIAL EDUCATION SHOPS

### I. INTRODUCTION:

A. The earliest type of school shop was the unit or single-activity shop. Such shops were equipped with hand tools or with overhead-shaft, belt driven machines. While the power equipment has been individualized and modernized, the unit shop is still in wide use. This is especially true in vocational trade and industrial education where the principal purpose of instruction is to develop a high degree of skill. The unit shop has a clearly defined purpose. It is also relatively easy to plan and equip, instructors are not difficult to find for it, and the problems of organizing and managing unit shops are comparatively simple.

B. The unit or single-activity shop functions readily as a production shop. Hence, it is industrial in nature and is the prevailing type in use in the manufacturing and servicing industries. Sheet metal, body and fender, cabinet making, photographic finishing, welding, machine turning, forging, drafting, upholstery, barber, bakery, radiator, watch repairing, patternmaking, etc., are examples of common unit type shops. The unit shop is based upon the trade, which is the fundamental unit of industry.

C. When a graded exercise course of study was taught in the unit shop, during the period of from approximately 1880 to 1905, the instruction was called Manual Training. Between about 1905 and 1920, projects took the place of exercises, and art principles in project design began to be stressed. This stage of school shop instruction was commonly called Manual Arts. Since about 1920, roughly, emphasis has been placed increasingly upon industrial information, and the name of school shop instruction for general educational purposes was changed to industrial arts.

D. Following the change from manual training, newer types of shops have been developed in order to better realize the objectives of a shop program that was organized to provide for the technological orientation of youth as a part of their general education. There are three types of such shops, all multiple-activity shops. The first of these is the limited general shop, or the general shop in a major industrial area (such as wood, metal, crafts, electricity, etc.), as it is often called. General automobile mechanics, or general woodwork, two or more unit activities in the same field, would be taught in the limited general shop. The second of the newer shop types, the composite or comprehensive general shop, incorporates activities from different industries, such as wood and metal and electricity, in one shop. A later type of shop, one that is still broader in scope, has come to be called a laboratory of arts and industries. It incorporates a large number of activities from many fields in one shop, and undertakes to make an experimental approach to industrial arts instruction. Thus, the unit shop represents a trade, the limited general shop represents an industry, and the comprehensive shop represents several basic industries.

E. All of these four types of shops are to be found in our schools today. Each type has advantages and limitations, and is adapted to serve satisfactorily in situations where its particular characteristics are required.

## II. OBJECTIVES

Provide the student with the opportunity to examine the types of shops analytically in order to determine the conditions under which each may yields the most desirable educational results.

## III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. In many cases misfits in class may be prevented by giving the course a descriptive title and the prerequisites for the course. Select a title and set forth for whom the course is intended along with the basic content of the course. The prerequisites should include such items as grade level, age, and courses completed.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications, Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946., pp. 302-306. 371, 426 E 68t

Miller, Rex and Smalley, Lee H., Selected Readings in Industrial Arts, McKnight and McKnight Publishing Co., Bloomington, Illinois, 1963, Chapters II, III, 371. 426 M 649s

## V. STUDY QUESTIONS

A. What type of shop is in common use for trade training purposes? Why?

B. What type of shop is used in the elementary grades?

C. When and where was Manual training first established in this country? What type of shop was used? (Ref. 2, pp. 302-303)

D. Why are unit shops still defended by both instructors and supervisors? (Ref. 2 p. 503).

E. What part of the industrial arts program is given the chief emphasis in laboratory of industries? (Ref. 2, p.304)

F. What type of shop is universally recommeded for the small junior high school? (Ref. 3, 196). For medium and large junior high schools?

G. What type of shop is recommended for the one-teacher industrial arts department, small rural or village high school?

H. What should be done with the large number of limited general woodshops in the small high schools of the country?

I. Under what conditions may limited general shops be used to advantage?

J. How would a clear understanding of the various types of the various types of industrial education shops, and the functions of each type, assist one in developing a satisfactory shop program?

K. What is the relationship between industrial education and industrial arts?

L. What qualifications should the comprehensive general shop instructor possess?

M. What is meant by Swedish Sloyd? What type of shop did the Sloyd system develop? (Rev. 2, p. 302)

N. How would you classify the school farm shop as to type?

O. What type of shop was the old blacksmith shop? The home basement shop?

P. How would you classify a school home mechanics shop as to type?

Q. How do the various types of shops compare with reference to cost?

R. What could be said for and against the development of shop standards with respect to type, equipment, and instructional practices?

S. Why would a clear knowledge of types of shops be helpful planning a new shop? Replanning an old one?

## UNIT II

## THE PRINCIPLES OF SCHOOL PLANNING

### I. INTRODUCTION

A. The problem of shop planning not only confronts the instructor in connection with new shops, but also in the rearrangement, expansion, or remodeling of old ones. It is safe to say, therefore that all shop instructors will find a need for a thorough understanding of the principles and practices of modern shop planning. In many instances, the practices of modern shop planning. In many instances, the necessity to plan a new shop, or to replan an old one, is the first problem the beginning instructor has to face.

B. Shop planning centers around such factors as location, kinds of buildings, floor space requirement, proportions, auxiliary rooms, equipment lay-out, appearance, heating, lighting, ventilation, etc. In the arrangement of these physical features of the shop for the most effective educational use with the minimum expenditure of effort, three basic principles are involved:

1. safety of the students and the instructor
2. instructional efficiency and effectiveness
3. industrial layout

A shop plan should be rated by the degree to which these principles have been incorporated, and are functional, in the operation of the given shop.

C. Many of the instructor's teaching problems may be eliminated or reduced through proper attention to the plan of the shop. Safety is one of the more important of these; others are problems of attitude, work and study habits, learning, and discipline.

### II. OBJECTIVES

To provide the student with an opportunity to develop insight into the essentials of interest of a better program of industrial education.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. After you have gained sufficient information, through your readings and class work, on the factors involved in shop planning, make a floor plan for one of the types of shops in your field of interest, indicating the dimensions, auxiliary rooms, entrances, student capacity, equipment lay-out, aisles, etc.

C. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, pp. 306-323, 371, 426; E 68t.

Mays, A. B. and Casberg, C. H., School-Shop Administration, Bruce Publishing Company, Milwaukee, Wisconsin, 1954, (Revised edition) Chapters 2, 4.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Co., Scranton, Pa., 1948, Chapter XVII.

Shop Planning Packet, Powermatic, McMinnville, Tenn., 1967.

## V. STUDY QUESTIONS

A. What problems are likely to arise in a poorly planned shop?

B. What is meant by shop planning?

C. List the important factors that must be considered in planning a school shop.

D. In what respects would the planning of a new shop differ from the re-planning of an old one?

E. In converting a unit shop into a general shop, what factors must be considered? A unit into a comprehensive general shop?

F. What are the trends in shop location and shop building construction.

G. What is the most frequent error made in the planning of school shops?

H. Why is a square room undesirable for a shop? (Ref. 2, p.2).

I. What auxiliary rooms should be considered in shop planning? (Ref. 3, pp. 11-12).

J. Give two excellent reasons for planning and developing the best possible appearance for the shop.

K. In what ways may safety features be engineered into the shop.

L. What material is regarded as the very best for a shop floor? What materials are regarded as satisfactory for the various kinds of shops?

M. What relationship should exist between the shop floor space and the window space?

N. What is the best light known to man?

O. Since the quantity and quality of light is directly related to safety what kinds and amounts of light are acceptable for shops and drafting rooms.

P. How important is the shop ventilation problem, and in what ways can it be solved?

Q. List the utilities that are necessary or desirable in the school shop.

R. What relationship should the stock room bear to the location of the equipment?

S. What points would you consider in rating a shop with respect to its plan?

T. What is meant by color dynamics? What should color dynamics have to do with shop planning?

U. What would be the advantage and disadvantage of standard shops, shops planned and equipment on a uniform basis?

V. What is the mximum number of students that various kinds of shops should be planned for?

W. What are the advantages of having the work-bench area separate from the machine area?

X. What is the standard height of work benches? How is this determined?

Y. What consideration should be given to electrical outlets?

Z. What are the advantages and disadvantages detached shop buildings.

AA. What elevation is most free from objectionable glare from the natural light?

BB. What is the rule for the relationship between the width of shop rooms and the distance from the floor to the tops of the windows?

CC. What are the three functional types of industries? Which of these types does the school shop tend to follow? Why?

DD. What is meant by the principle of industrial sequence in shop planning? (Ref. 2, p.322)

EE. Explain the principle of area lay-out as used in the intermittent process industries.

FF. In waht shop is both area and sequence lay-out often found?

GG. In what ways may the shop be planned in order to facilitate instruction?

HH. What methods are commonly used for attached power machines to shop floors? (Ref. 3, pp. 50-52).

II. What considerations are involved in placing equipment? (Ref. 2, pp. 321-322).

JJ. What are the arguments for and against auxiliary rooms?

KK. What two auxiliary rooms are regarded as having common usefulness in all kinds of shops?

## UNIT III

## SELECTION AND PURCHASE OF TOOLS AND EQUIPMENT

### I. INTRODUCTION

A. The tools and equipment for the school shop are obviously items of considerable importance in planning and operating the shop. In fact, the planning and lay-out of the shop is mutually interrelated to the problem of selecting and purchasing equipment. The tools and equipment represent the relatively fixed capital of the shop. This is usually not only a sizeable financial outlay for the school, but determines the general usefulness of the shop, in the realization of the educational objectives intended, for years to come. The instructor should therefore have as much as possible of both a "technical" and a "consumer knowledge" of what constitutues satisfactory tools and equipment. To obtain such knowledge, careful study should be given to the questions of type, size, and quality of equipment to be used both for new shop installations and for replacement purposes.

B. In recent years, school shop equipment has been subjected to an accelerated redesign and improvement. Better balance and weight distribution has enabled manufacturers to reduce the bulk and size of power machines and at the same time decrease vibration. Also, new and improved materials and processes have contributed to better quality equipment. A variety of new type and special machines have also appeared. The number of companies manufacturing school shop equipment has increased in recent years; and the range of choice in sizes, models, and quality is wider than was formerly the case. Used and surplus equipment is also likely to become increasingly available again from private dealers. These factors complicate the problem of the wide selection and purchase of machines for the shop.

### II. OBJECTIVES

Provide the student with an opportunity to examine the problem of the selection and purchase of school shop tools and power machines, taking into consideration the shop plan, objectives, activities included, finances available, courses to be offered, class size, age level of students, etc. Sources of tools and equipment, specifications, methods of purchase, what to purchase first, composite machines, used equipment, and the installation of machines.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Develop an ideal list of tools and equipment for the shop you planned in Unit II.

C. Write the names and addresses of five dealers, who sell equipment suitable for school shops.

D. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, pp. 312-323, 371, 426 E 68t

Mays, A. B. and Casberg, C. E., School-Shop Administration. Bruce Publishing Co., Milwaukee, Wisconsin, 1954, (Revised Edition) Ch 3.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Co., Scranton, Pa., 1948, Chapter XVIII.

Shop Planning Packet, Powermatic, McMinnville, Tennessee, 1967.

## V. STUDY QUESTIONS

A. When funds are low, what tools and equipment should be purchased first? (ref. 2, pp. 322-323)

B. When estimating the cost of equipment, what items are most often overlooked? (ref 3, pp. 35-56)

C. On the light versus heavy power machine question, what are the respective arguments? What seems to be a sensible solution for most shops? (ref. 3, pp. 40)

D. The school shop is a small intermittent process industry, well suited to securing maximum learning results from students. What kind of equipment is best for such shops?

E. What has been the trend in industry on power machine equipment? Why?

F. What are the most important factors to consider with respect to the design and quality of equipment? (ref. 3, pp. 37-38).

G. How would you check a used machine which you had under consideration for purchase?

H. What should one look for in hand tools? (ref. 3, pp. 42-43)

I. What should be included in equipment specifications?

J. In what two ways may equipment be purchased?

K. What precautionary points are necessary in preparing specifications to be submitted for bids? (ref. 2, pp. 319-320)

L. Name some local, state and regional sources of shop equipment.

M. How would an instructor proceed to locate sources of equipment supply?

N. What safety factors should be looked for on power machines?

O. How should the shop instructor deal with the administrators on financial matters? (ref. 2, pp. 320-321)

P. In what ways might an instructor gain the support of the community and thus secure funds for his shop program?

Q. Should combination machines be purchased for use in school shop? (ref. 2, pp. 318-319)

## UNIT IV

## SELECTION AND PURCHASE OF MATERIALS AND SUPPLIES

### I. INTRODUCTION

A. The materials and supplies needed for the operation of the shop depends upon such factors as the nature of the courses offered, the projects to be made and the number of learners to be served. In any case, the purchase, storage, and issue of materials and supplies--having them available when needed--constitutues one of the shop instructor's major problems. During the course of the year's work, the quantity and variety of such items used may reach a sizeable total and involve a considerable outlay of fluid capital.

B. Except for the purchase of books for the shop library, materials and supplies represent capital that is consumed in the process of making useful projects. They must therefore be replaced regularly. This is a kind of flow capital in contrast to the more permanent capital investment found in tools and machines. For this reason, a system for the issue of materials and supplies, so the records for payment can be kept and reimbursement made, is an essential of good shop management.

C. Shop rooms, equipment, and materials, and supplies are provided for the one purpose of creating suitable conditions for learning experiences to take place. One of the more important of our tools of instruction is the printed page--books, pamphlets, and magazines. Formerly, books were identified, not with shop instruction, but with academic subjects. This situation has changed. Today, the shop instructor has come to rely on books and periodicals as a source of ideas, technical information, and modern developments both for himself as well as for his students. Hence, among the supplies needed in all shops are the materials that go into a good shop library.

D. While practices with respect to the purchase, storage, issue, and use of materials and supplies vary from school to school, there is enough similarity in the plans used to warrant our careful study of them. Such a study should assist the in-experienced instructor in developing satisfactory standards for his shop.

### II. OBJECTIVES

Provide the student the opportunity to explore the problems of:

1. Selecting and purchasing materials and supplies.
2. Selecting sources of materials and supplies.
3. Providing for the storage of large and small items.
4. Providing for the building of a shop library.
5. Providing for the issue of materials, supplies, tools, and books.

## III. ASSIGNMENT

A. Read the asterisked references first then other as you think time permits.

B. In a one-page paper, make out an order for five items of materials and five items of supplies which you will need in your shop.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, pp. 23-24; 133-137; 148-154-244-245 371.426, E 68t

Mays, A. B. and Casberg, C. H., School-Shop Administration, Bruce Publishing Company, Milwaukee, Wisconsin, 1954. (Revised edition) Chapter 6,7.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Co., Scranton, Pa., 1948, Chapter XII.

## V. STUDY QUESTIONS

A. How may the instructor estimate accurately the materials and supplies that will be needed? (ref. 2, p. 24)

B. How long in advance should materials and supplies be stocked? (ref. 2, p. 24)

C. What time of the school year is the most desirable for ordering materials and supplies? (ref. 2, pp. 244-245)

D. What are the best practices for writing orders to be submitted as bids? (ref. 2, p. 81)

E. What makes of drills, planes, hand saws, files, and hammers have a reputation for high quality?

F. For the drafting room, what are the quality brands of instruments, pencils and paper?

G. What are the sources of supply for radio and electronics shops?

H. What are regarded as the most satisfactory methods for storing such small supplies as screws, bolts, nails, small handware, etc.? (ref 3, pp. 76-80)

I. What common methods of handling purchases are in use in the schools? (ref. 3, pp. 78-80)

J. What are the difficulties of obtaining comparable bids? (ref. 3, pp. 81-82)

K. How does the inventory system bear upon the problem of keeping an adequate stock of materials and supplies?

L. How may the instructor go about building up his shop library?

M. Name five publishers of books in the field of industrial education.

N. What are four types of books in use in industrial education? Which types is the most popular with shop instructors? (ref. 2 pp. 149-150)

O. What advantage would a shop instructor with a good library have over one without a library? Does the use of the library involve any of the objectives of industrial arts?

P. What is meant by the instructor's professional library.

Q. How would you determine the value of a book for the shop library?

R. Does the adoptions of a textbook for the class diminish the need for a shop library?

S. Where should the shop library be located?

T. What methods of stimulating the use of library materials are effective?

U. How can the shop library be made readily usable and the books still kept under control?

V. What are the common methods of issuing tools? (ref. 3, pp. 93-96)

W. What are the common methods of issuing supplies? (ref. 3, pp. 92-93)

X. What are the essentials of success in tool, material and supply and library control? (ref 3, p.92)

Y. How should money paid by students for materials and supplies be handles? (ref. 2, p. 136)

Z. What are the advantages of volumn purchases? (ref. 2, p.75)

AA. What is the first thing an instructor should do in taking over a shop?

BB. What is a contingent fund? How large should this fund be for the small, and large shop? (ref. 2, pp. 84-85)

## PART II
## THE OPERATION OF SCHOOL SHOPS

## UNIT V

## SHOP RECORDS, INVENTORIES AND REPORTS

### I. INTRODUCTION

A. The shop instructor faces the problems of making periodic reports to school officials, securing data for the management of his shop, and making various other decisions upon the bases of recorded experience. These matters all involve records, and raise the question of systematizing the keeping of essential records and inventories as a part of shop management.

B. Records have been classified into two catagories:

1. Those required by school officials.
2. Those needed directly in the operation and management of the shop.

To some extent, these classifications overlap, expecially those concerned with pupils, finances and material and equipment. Usually, those records concerned directly with shop instruction, such as drawings, assignments, etc., are of use only to the instructor.

C. While the preparation of records, keeping them up-to-date, proper filing, etc., is regarded as one of the less pleasant of the instructor's duties, the consequences of poor record keeping invariably entail more effort and difficulty than that required to maintain a well-organized system.

### II. OBJECTIVES

Provide the student with an opportunity to examine some of the basic shop records, the manner in which they are prepared and filed, and their uses in connection with reports, and other problems of school shop operation.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. In a one or two page paper, develop a plan for keeping records in your shop.

C. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, pp. 131-138; 24-245

Mays, A. B. and Casberg, C. H., School-Shop Administration, Bruce Publishing Co., Milwaukee, Wisconsin, 1943, (revised edition), Chapter 8.

Wilber, Gordon O., Industrial Arts in General Education, The International Textbook Co., Scranton, Pa., 1948, Chapter XVI

## V. STUDY QUESTIONS

A. What basic records should be kept in any type of shop?

B. What special kinds of records might be advisable in a particular type of shop or a particular school situation?

C. What physical facilities are necessary for the orderly maintenance of a set of records?

D. How may shop records be classified? (ref. 4. pp. 328-341)

E. How would you keep a shop inventory up-to-date? (ref. 3, pp. 103-104)

F. What might be the value of keeping a current inventory of equipment? Of supplies? (ref. 3, pp. 109-111)

G. What three principal factors are involved in the depreciation of shop equipment? (ref. 3, pp. 104-106)

H. Why is it necessary to have a mathematical method of progressively lowering the value of equipment? What two methods are in general use? (ref. 3, pp. 104-109)

I. How does the percentage-on-original-cost method differ from the percentage-on diminishing-value plan? (ref. 3, pp. 104-108)

J. What records connected with shop instruction should be kept by the instructor? (ref. 3, p. 100)

K. What are the characteristics of a good record system? (ref. 3 pp. 101-102)

L. To what extent may the instructor use student aid in record keeping? (ref. 2, pp. 241-242)

M. Name five kinds of reports the shop instructor should make in closing out the school year? (ref. 2, p. 243)

N. What is a progress chart? How is it made? How is it kept up to date? (ref. 4, pp. 241-243)

O. How might a project file be accumulated and organized?

P. What safety records should the instructor keep?

## UNIT VI

## MAINTENANCE AND SHOP-KEEPING

### I. INTRODUCTION

A. After the shop is properly set up, and even before, an important factor in managing it at maximum efficiency is that of maintenance. Satisfactory maintenance of equipment and tools, and control of supplies depend largely upon the resourcefulness, interest and industry of the instructor.

B. Shop maintenance has reference to the keeping of equipment, tools, accessories, furniture, rooms, and other items used, in first class operating condition. In a broader sense, it also includes the up-keep and provision of such supplies as blueprints, charts, teaching devices, aids, facilities and materials so that they may be ready for use when needed. Also broadly speaking, shop keeping is a part of maintenance. Maintenance and control of the shop, in this sense, requires daily attention, planning and foresight.

### II. OBJECTIVES

Provide the student with the opportunity to examine the various shop inter-relationships, and the bearing of successful maintenance on the effectiveness of instruction and the success of the instructor.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. In a one-page paper, draft a plan for keeping the equipment and tools in good operating order. The plan should involve preventive maintenance, and repair maintenance.

C. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, pp. 113-115, 371.426 E 68t

Mays, A. B. and Casberg, C. H., School-Shop Administration, Bruce Publishing Co., Milwaukee, Wisconsin, 1954 (revised edition) Chapter 5.

### V. STUDY QUESTIONS

A. What is meant by preventive maintenance? (Ref. 2, pp. 113-114)

B. How is maintenance related to safety?

C. Give the advantages of a routine system of sharpening cutting-edge tools. Why is this practice not more often followed?

D. What is meant by an inspection check list? How is it used?

E. What factors are of considerable importance in machine maintenance? In motor maintenance? (Ref. 3, pp. 68-69)

F. How may students be used in the program of shop maintenance so as to have the work contribute to their education? (Ref. 2, p. 115)

G. What provision should be made for the learning of such maintenance or auxiliary operations as saw filing, tool grinding, brazing, machine adjustments, etc., by prospective shop instructors while in training?

H. What relative importance do you attach to shop maintenance in comparison to planning the shop, lighting, and ventilation, safety, the shop library, etc?

I. How is the problem of shop keeping handled in various school shops? (Ref. 2, pp. 115-116)

J. In what ways are maintenance and shop keeping related?

K. What would be the value in out-of-school life in teaching students the care and upkeep of tools and machines?

L. What are the advantages of a regular use of the inspection check list? (Ref. 3, pp. 64-65)

M. How may machines, that are to be idle for long periods of time, be protected from rust? (Ref. 3, p. 70)

# UNIT VII

## SHOP SAFETY PROGRAM

### I. INTRODUCTION

A. The responsibility for the safety of the students in the shop rests with the instructor. Accordingly safety is a vital part of all instruction on operations where there is a possibility of injury. The other aspect of shop safety is concerned with keeping the physical plant and equipment in safe operating condition.

B. Such a program is based upon studies of the causes of accidents. Over 90% of injuries are found to result from human failure, and less than 10% from machine failure, or failure of the environment. Human failure, a pitfall for the careless and the in-experienced, can be overcome only by the type of instruction that leads to safety consciousness in all of the under takings of the individual. This phase of the student's education is an asset to him in industrial occupations as well as other phases of his life. It can be developed in the school shop perhaps better than in any other school activity.

C. Machine or environmental failure, causing injury, may be controlled most effectively by regular preventive maintenance, attention to safety devices and use of the machine for the purpose intended.

### II. OBJECTIVE

To provide the student an opportunity to develop a philosophy of shop safety, and a plan for putting into action.

### III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. In a one-page paper, show how you can make sure a student knows the safety points involved in operating a particular machine before he is permitted to operate it. (This involves a machine safety test)

C. Make a one-page accident report form

D. Be prepared to make some comments during class discussion regarding the study questions.

### IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, Chapter VI, 371.426 E 68t

Mays, A. B. and Casberg, C. H., School-Shop Administration, Bruce Publishing Co., Milwaukee, Wisconsin, 1954, (Revised Edition) Chapter IX.

Silvius, G. H. and Curry, E. H., Teaching Successfully in Industrial Education, McKnight & McKnight Publishing Co., Bloomington, Illinois, 1967 Part 4, Topics 21, 22, 23, 24, 25, 26.

## V. STUDY QUESTIONS

A. Should the shop instructor be held responsible for the safety of his students? (Ref. 3, pp. 114-115: Ref. 4, topic 26)

B. What are the danger points common to all school shops? (Ref. 3, pp. 123-124)

C. How can carefully made accident reports be used to improve safety in the shop? (Ref. 4, Topic 25)

D. What items should be scrutinized in a safety inspection of the shop? (Ref. 3 pp. 123-124)

E. How can the students be organized so as to play an important part in the safety program of the shop? (Ref. 4, pp. 360-361)

F. What is meant by "Man Failure"? (Ref. 3, p. 121)

G. How can man failure be reduced through instructional practices? (Ref. 3, p. 121)

H. What are some of the causes of machine failure? (Ref. 3, p. 120)

I. What precautions would be effective in reducing machine or environmental failure? (Ref. 3, p. 120)

J. How can we broaden shop safety so as to promote safety consciousness in the activities of the student outside of the shop? (Ref. 2, p. 174)

K. What procedure is advisable in case of a shop accident? (Ref. 4, p. 368)

L. Should a school shop ever be left in charge of a member of the class?

M. What types of aids may be used to promote shop safety?

N. How should shop rules be made, and what are their values?

O. What is meant by a philosophy of safety?

P. Should the instructor ever leave the shop while the students are at work?

Q. From what three angles should shop hazards be studied?

R. What is the case for positive and negative methods of safety instructions?

S. What steps should be taken in case of an accident?

## UNIT VIII

## PERSONNEL MANAGEMENT AND DISCIPLINE

### I. INTRODUCTION

A. There is a close relationship between shop organization and management, and discipline. In a well-managed shop, learning results are certain to be satisfactory while discipline problems are equally certain to be negligible. The reverse is generally true of poorly managed shops. Hence, the solution to the problem of poor discipline is to organize it out of the shop.

B. In order to properly organize the shop, attention should be given to the (1) physical features of the shop, (2) student organization and personnel matters, and (3) the instructional program. It might also be added that the instructor, in working on these aspects of discipline, should constantly exercise self-criticism. He should make daily evaluations of his work, and, on the basis of his experience, strive to make such corrections as reflections upon his experience, indicate to be advisable.

C. Selection of the type of shop, the planning of the shop, the tools and equipment, the materials and supplies, the shop environment, the course of study, and the instructor are all provided by the community for the purpose of developing students in the various aspects of technology. We have examined, in some detail, many of the matters involving the physical features of the shop, as they relate to this purpose.

D. Student organization is concerned with bringing the student into contact with the shop in an active and comprehensive manner in order to give him both depth and variety of experience. It is through such experience that his interests are uncovered and his capacities developed. Students who are involved in meaningful experiences are becoming disciplined in the positive sense.

E. Aside from experiences involving creativity, the acquaisition of industrial information, and the development of skill, experience in human relationships is essential for youth. Shop instructors today are more aware of this fact than formerly, and various types of student organizations for carrying out the duties and responsibilities of the shop class have evolved. Such a personnel organization usually consists of a general manager, safety engineer, stock foreman, cleanup foreman, toolroom foreman, maintenance engineer, and class secretary. Duties of these officers are drawn up and clarified, and the positions are rotated among the class membership at periodic intervals. At the inception of a student personnel organization, the instructor must be careful to fully explain its purpose, and its importance in the operation of the shop.

F. An even more important form of organization is the shop course of study. Most discipline problems can be traced to the lack of an adequate educational program for the shop. Students are not slow to sense an absence of purpose in the shop work as shown by poor project assignment and selection, lack of proper text books, bungled methods of teaching, lack of daily preparation shortage of materials and supplies, and a shoddy system of evaluation. On the contrary, the instructor should be able to present a positive and attractive program of work. He should plan an educational program in advance for every individual student, a program that is fixed with respect to the overall framework but flexible within that framework. He should encourage creativity and problem selection, but be prepared to operate in case his encouragement does not, in all cases, bring satisfactory results.

## II. OBJECTIVE

Provide the student with the opportunity to examine those factors of shop personnel and educational organization that have direct bearing upon shop discipline, discipline being considered in both the positive and the negative senses.

## III. ASSIGNMENT

A. Read the asterisked references first then others as you think time permits.

B. Develop and prepare a personnel management plan for your shop.

C. Be prepared to make some comments during class discussion regarding the study questions.

## IV. REFERENCES

* Modern School Shop Planning, 6th Edition, Prakken Publications Inc., Ann Arbor, Michigan, 1972.

* Ericson, E. E., Teaching the Industrial Arts, The Manual Arts Press, Peoria, Illinois, 1946, Chapters III, IV, XIII, 371.426 E 68T

Mays, A. B., and Casberg, C. H., School-Shop Administration, Bruce Publishing Company, Milwaukee, Wisconsin, 1954, (Revised edition) Chapter 11, 12.

Wilber, Gordon O., Industrial Arts in General Education, International Textbook Co., Scranton, Pa., 1948, Chapter XIII.

## V. STUDY QUESTIONS

A. What does the term "discipline" mean when applied to teaching? What are the purposes of discipline?

B. What is meant by shop management? How is this related to discipline?

C. What constitutes good discipline in the school shop? What factors are essential for good discipline? (Ref. 2, pp. 84-90 ; Ref. 3, p. 142)

D. What physical features of the shop are desirable for good shop management? (Ref. 2, pp. 90-93)

E What specific things can the shop teacher do to insure good discipline? (Ref. 2, pp. 93-100)

F. What things should be avoided in the interest of good discipline?

G. How can a student personnel organization be developed in the shop? (Ref. 4, pp. 197-207)

H. Aside from the advantages with respect to discipline and shop management, what values may be derived from assigning students routine responsibilities in the shop? (Ref. 2, Chapter IV; Ref. 4, pp. 195-197).

I. Explain the operation and functions of the assignment wheel".

J. What principles should govern the selection of shop projects?

K. How should projects be prepared for instructional purposes?

L. How should informational topics be prepared for teaching purposes?

M. How is the course of study related to the question of discipline?

N. Why is a list of standard projects desirable? How should such a list be used?

O. In what ways may the instructor determine student progress?

P. In what ways might an insturctor, who is having discipline problems due to individual personality factors, proceed on a program of self-improvement?

THE UNIVERSITY OF CENTRAL ARKANSAS
INDUSTRIAL EDUCATION DEPARTMENT
CONWAY, ARKANSAS

# EVALUATION OF INSTRUCTION IN VOCATIONAL INDUSTRIAL SUBJECTS

Vocational-Industrial Education 2304

Three Semester Hours
Credit

SYLLABUS FOR THE COURSE

January 1977

"WITHOUT TOOLS MAN IS NOTHING: WITH TOOLS HE IS ALL."

## SOMETHING TO THINK ABOUT

"Man is a Tool-using animal. Weak in himself, and of small stature, he stands on a basis, at most for the flattest-soled, of some half-square foot, insecurely enough; has to straddle out his legs, least the very wind supplant him. Feeblest of bipeds! Three quintals are a crushing load for him; the steer of the meadow tosses him aloft, like a waste rag. Nevertheless he can use Tools, can devise Tools; with those the granite mountain melts into light dust before him; he kneads glowing iron, as if it were soft paste; seas are his smooth highway, winds and fire his unwearing steeds. Nowhere do you find him without Tools: Without Tools he is nothing, with Tools he is all."

------Thomas Carlyle

"We are always in these days endeavering to separate intellect and manual labor; we want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen in the best sense. As it is, we make both ungentle, the one envying, the other despising his brother; and the mass of society is made up of morbid thinkers and miserable workers."

------John Ruskin

THE UNIVERSITY OF CENTRAL ARKANSAS
Conway, Arkansas

Vocational-Industrial
Education - 2304

## EVALUATION OF INSTRUCTION IN VOCATIONAL-INDUSTRIAL SUBJECTS

Course Contents:

| | |
|---|---|
| Unit I. | INTRODUCTION: THE PROBLEMS OF PSYCHOLOGICAL AND EDUCATIONAL MEASUREMENT. |
| Unit II. | CLASSIFICATIONS, CHARACTERISTICS, AND USES OF TESTS. |
| Unit III. | CONSTRUCTION OF INFORMAL INFORMATIONAL TESTS |
| Unit IV. | EVALUATION OF SHOP AND LABORATORY PERFORMANCE. |
| Unit V. | STANDARDIZED TESTS IN INDUSTRIAL EDUCATION. |
| Unit VI. | SUMMARIZING, INTERPRETING, AND USING TEST RESULTS. |

## INTRODUCTORY STATEMENT

Vocational-Industrial Education 2304, Evaluation of Instruction in Vocational-Industrial Subjects, is designed to provide the teacher of Vocational-Industrial (T&I) Education an opportunity to learn the techniques of utilizing and developing learning achievement evaluation instruments and to measure and evaluate quality of instruction for Vocational-Industrial Subjects.

### I. Course Organization

A. This course is organized into six units of instruction which are outlined in separate assignment sheets in this syllabus. Each unit contains an introduction, unit objectives, specific assignments, references, and a group of statements and/or questions to be dealt with according to each set of instructions.

B. The assignment will specify exactly what you are expected to do including the readings, investigations, and reports required in each unit.

C. The statements and questions are intended to guide your readings and to present problems which should help you to interpret the facts, evaluate ideas, and formulate judgments.

D. Comprehensive evaluation will be made:

1. at the conclusion of each unit
2. at the conclusion of the course

### II. Written Assignments

A. The assignments specified in each unit should be prepared in a careful and scholarly manner. Unless your writing is perfectly legible, your written work should be typed. The maximum length of each report will be specified in terms of double-spaced typed materials.

B. It is expected that references should be used in the preparation of assignments. In all cases where direct quotations are used, give footnote references, including in sequential order:

1. Author
2. Exact title
3. Edition and volume
4. Name of publisher
5. Location of publisher
6. Date of publication
7. Page or chapter of quotation

C. Where no direct quotations are given in a report, simply list a bibliography of the materials utilized in preparing the assignment.

D. Attach a cover page to each written assignment providing the following information:

1. Your name
2. The course number and title
3. The unit number
4. The exact titles of your paper. (Not the title of the unit)
5. Date paper was prepared

E. Staple the pages together in the upper left corner. Do not fold and d do not use binders or folders!

## III. Course Objectives

This course has been structured to provide students with an opportunity to gain experiences which would enable them to:

A. Develop an understanding and appreciation of the need for and value of evaluating quantity and quality of both learning and instruction.

B. Develop an understanding of the problems of individual differences, the principles and concepts used in testing, the techniques available and current treands in the testing movement.

C. Understanding of the classification and characteristics of various test instruments.

D. Understanding of the measurable factors, testing techniques and other considerations involved in informal test construction.

E. Understanding of performance and project evaluation process and techniques.

F. Understanding and ability to summarize, interpret and utilization of test results.

## IV. Basis of Evaluation

A. Objective tests

| | | |
|---|---|---|
| 1. Unit tests | 20% | |
| 2. Final test | 20% | |
| | Total | 40% |

B. Evaluation Instruments

| | | |
|---|---|---|
| 1. Written | 30% | |
| 2. Performance | 30% | |
| | Total | 60% |
| | GRAND TOTAL | 100% |

## UNIT I

## THE PROBLEMS OF PSYCHOLOGICAL AND EDUCATIONAL MEASUREMENT

### I. Introduction

A. The evaluation of the results of instruction is of vital importance to the teacher in several respects. It is upon the basis of the evaluation that instruction may be adapted to the needs and capacities of the learner. Student motivation is related to the matter of evaluation; and such administrative actions as the selection of courses, promotion, and graduation depend largely upon the evaluation of the accomplishments of students. For these reasons, one of the most fertile areas for the use of science in education has been in the development and refinement of our testing and measuring instruments.

B. The problem of the nature and quality of the raw material of education, the student, has long been a perplexing and difficult one. What is the student's intellectual equipment, his particular aptitudes, his preferences, and his personality traits? Information of a reliable nature on these questions, obviously, is of considerable importance to those concerned with the student's educational development, and social and occupational adjustment. It has been the function of the tests and measurements movement in education to provide increasingly accurate answers to these questions.

C. The use of the results of a variety of standardized tests is coming to be an accepted practice, not only in educational institutions, but also in the fields of industry, the military services, and in public employments. Here occupational guidance, training, and adjustment to a vocation, may be given on a much more scientific or intelligent basis, through the use of information derived from modern testing techniques, than would otherwise be the case.

D. It is for these reasons that we should examine briefly the background of the testing movement. Such a perspective should increase our understanding of the problem of individual differences, the distance that has been covered, the nature of testing developments, the principal concepts used in testing, and the uses that can be made of the techniques available, and present trends in the testing movement.

### II. Objectives

A. General:

Develop an understanding of the principles and concepts used in the evaluation process and an awareness of the techniques available for use by the Vocational-Industrial Instructor.

B. Specific:

1. The learner will develop a comprehension of the testing movement.
2. The learner will gain increased understanding of the problems of individual differences.
3. The learner will gain an understanding of the current trends in the testing movement.

## III. Assignment

A. Read the asterisked references first, then others as you think time permits.
B. Be prepared to answer the questions pertaining to the unit.

## IV. References

1. Wood, Dorothy Atkins, Test Construction Development and Interpretation of Achievement Tests, Charles F. Menill Books, Inc., Colombus, Ohio, 1961. (Text)

*2. Micheels, W. J., and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Co., New York, N. Y., Latest Edition.

## V. Study Questions

A. What would you say were the basic question or problem that gave rise to the psychological testing movement? Educational testing?

B. "The judgment of teachers with respect to student achievement is usually rather accurate." What evidence is there to support or refute this statement?

C. Trace the high points in the development of intelligence testing.

D. What modern psychological theory gave impetus to the growth of tests and measurements?

E. Who were the pioneers in the development of standardized educational tests?

F. What was the nature of educational measurement under the doctrine of faculty psychology?

G. How did the question of individual differences figure in the historical development of tests?

H. In what ways would improved techniques of testing be of value in the teaching profession?

I. What contributions did the following men make to the development of objective measurements: Goddard, Rice, Otis, Cattel, Stone, Thorndike, Courtis, Binet, Wundt, Terman, Galton?

J. What two lines of development have characterized the history of the testing movement?

K. What psychologist developed the quality scale?

L. Who developed the curve of normal distribution? In what scientific fields does this curve apply? What is the significance of this curve with respect to the problem of individual differences?

M. What are the quantitative differences between an idiot, imbecile, and moron?

N. What are the basic principles of psychological measurement upon which Binet developed his intelligence test?

O. Where and when were group intelligence tests developed. Who developed them and under what conditions?

P. Who developed the idea of the intelligence quotient?

Q. Contrast the last two periods in the growth of the testing movement.

R. Identify the name of the individual, and the approximate date, connected with the following concepts. (1) Balance of three mental powers; (2) Curve of normal distribution; (3) Mental age; (4) Norm or level of achievement; (5) Ranking individuals with respect to each other; (6) Group test of intelligence; (7) the IQ; and (8) Rate test.

S. Of the various types of tests that have been developed, which ones would appear to be of the most value to the Industrial Education instructor?

## UNIT II

## CLASSIFICATIONS, CHARACTERISTICS, AND USES OF TESTS

### I. Introduction

A. The growth of the testing movement has been so rapid and varied that the exact classification of tests is a difficult matter. Some types of tests can be placed in more than one category, depending upon the angle from which they are viewed, their content or the purpose for which they are used. Tests are often classified historically, as we saw in Unit I, into the two general categories of (1) mental and (2) educational. Mental or psychological tests are designed to measure (a) intelligence, (b) aptitude, (c) attitude, (d) preference, or (e) emotional adjustment. Some of these are to measure the results of instruction and learning. They may be of the (1) oral, (2) essay, or (3) objective type. The latter type is further classified as (a) informal, and (b) standardized. There are also so-called rate tests, power tests, scales, scaled tests, diagnostic and remedial tests, and many other varieties too numerous to consider in detail. But a rough dual classification along the foregoing lines assists one in understanding the functions and purposes of the various tests and scales.

B. Inasmuch as educational tests are most frequently classified in accordance with function, their uses are apparent, to some degree, in the classification. That is to say, tests are used to (1) measure pupil achievement; (2) establish standards of performance; (3) motivate learning; (4) promote, graduate, and place pupils; (5) guage the efficiency of instruction; (6) provide educational and Vocational guidance; (7) evaluate teaching materials and methods; and, (8) to carry on certain types of research work. It is to be noted that while we usually think of the uses of tests in connection with education, both educational and psychological tests are coming to be used extensively in activities outside of the school.

C. A test properly fulfills its particular function only insofar as it is (a) valid, (b) reliable, (c) administerable, (d) adequate, (e) objective, (f) scorable, (g) economical, (h) comparable, and (i) serves a definite need. Such criteria of a good examination, some of which are exacting and time-consuming in test construction, represent ideals for test development, and are realized only in varying degrees.

D. In this unit, we are to investigate the questions of test classification, uses, and characteristics in the interest of a better understanding of tests and the principles involved in their construction and use.

### II. Objectives

A. General:

The learner will further his comprehension of evaluation principles, their use and construction.

B. Specific:

1. The learner will classify evaluation instruments according to their use.
2. The learner will list the characteristics of the various evaluation instruments.
3. The learner will identify the principles involved in the use of the various evaluation instruments.

## III. Assignment

A. Read the asterisked references first then others as you think time permits.
B. Develop a one-page chart showing the types of (1) psychological and (2) educational tests, and the uses of each type.

C. Be prepared to answer the questions pertaining to the unit.

## IV. References

1. Woods, Dorothy Atkins, Test Construction, Charles H. Merill, Columbus, Ohio, 1961.

*2. Micheels, W. J., and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Co., Inc., New York, N. Y.

## V. Study Questions

A. How would you classify an intelligence test?

B. What values might psychological tests have to the problems of the educational adjustment of students?

C. How are educational tests classified with respect to type?

D. What is the difference between an informal and a standardized objective achievement test?

E. What are the weaknesses of the essay-type test?

F. Give the principal uses of tests and measurements.

G. What is meant by the validity of a test?

H. What is meant by reliability, objectivity, adequacy, and economy as test criteria?

I. Show how the practical usefulness of a test depends upon its administrability and scorability.

J. How would you classify a test of mechanical aptitude? Emotional adjustment?

K. How would a knowledge of a student's interests and attitudes be of value to an instructor?

L. Explain the meaning of rate tests, power tests.

M. What is a scaled test?

N. What types of tests are of most importance to the teacher of Industrial Education Subjects?

## UNIT III

## CONSTRUCTION OF INFORMAL INFORMATIONAL TESTS

### I. Introduction

A. In the preceding unit, we examined the classification and numerous types of tests and measurements, test characteristics, and the general uses of tests in education. As a result of this study, it is apparent that many of the various tests, as well as testing techniques, in general use in education can be readily used in the field of Industrial Education. That is to say, psychological or mental tests are as useful to the instructor in Industrial Subjects as to the academic teacher, and many of the techniques of educational testing can be used with particularly good results in the Industrial area.

B. This, however, raises the questions of what are the factors in Industrial Education that are amenable to measurement; and, out of the various techniques in use, which ones are best adapted to doing the job? Some of the more important measurable factors in Industrial Education may be listed as follows:

(1) General intelligence
(2) Special intelligence or aptitude
(3) Personality measurements--attitudes, preferences, emotional adjustments
(4) General achievement
(5) Informational and theoretical content acquired in specific Industrial Education subjects
(6) Quality of projects or jobs completed, including drawings in specific fields.
(7) Ability to develop suitable plans for doing jobs
(8) Shop skills
(9) Appreciative or artistic judgment
(10) Ability to solve problems

C. The numerous specific measurable factors may be reduced to three: (1) psychological, (2) informational, and (3) performance

D. The testing techniques required for the evaluation of these measurable factors will vary with the particular factor. In general, they parallel those types of tests in wide use in all fields, particularly selected and adapted, with respect to content, for use on the specific factors in the Industrial area.

E. The measurement of achievement in shop courses presents a much broader problem than in most academic subjects. The shop instructor, that is to say, is called upon to devise tests for the measurement of skill or performance in addition to informational achievement. While the measure of knowledge and information in the shop field is not unlike that in other fields, performance or manipulative tests present certain special difficulties.

F. It is rather generally agreed that some of these difficulties stem from the carry-over of paper-and-pencil test techniques into the area of the measurement of manipulative achievement without alteration of procedures in giving the tests. The successful development and presentation of performance tests involves intensive background preparation with respect to test construction, directions, and materials and equipment.

G. A long-time basic trend in Industrial Education, and particularly in the Industrial Arts, has been the increasing scope of course content on the informational side. Technical advancements have accentuated such an emphasis in all areas. The development of Industrial Arts as a part of general education is representative of this tendency toward the broadening of content. But the current emphasis upon information has brought the Industrial Education instructor face-to-face with the necessity for mastering the techniques involved in constructing and using informal tests of achievement similar to those used in other school subjects.

H. Both during test construction, and after the test is given, "item analysis" should be used to increase the reliability of the test.

II. Objectives

A. General:

Give the learner an opportunity to develop the ability to analyze the evaluation of learning.

B. Specific:

1. The learner will be able to list the measurable factors in Vocational-Industrial Education.
2. The learner will be able to describe current testing techniques used in Vocational-Industrial Education.
3. The learner will be able to perform an item analysis to validate reliability of an informal evaluation instrument.

III. Assignment

A. Read the asterisked references first then others as you think time permits.
B. Develop an informal achievement test of information for some course, or segment of the course, in your subject area.
C. Be prepared to answer the questions listed on the next page.

IV. References

1. Wood, Dorothy A., Test Construction, Charles H. Merrill, Columbus, Ohio, 1961.

*2. Micheels, W. J., and Karnes, M. Ray., Measuring Educational Achievement, McGraw-Hill Book Co., Inc., New York, N. Y., Latest Edition.

V. Study Questions

A. What is meant by a measurable factor?

B. Would reading ability as a measurable factor bear upon the mearure of achievement in Industrial Education?

C. What kinds of words could be used to make up a spelling test in Industrial Subjects?

D. How would you make a test for objectively determing a learner's ability to plan an attack on a shop problem?

E. What two general classes of techniques would an Industrial Arts instructor use to measure informational achievement?

F. What is meant by a testing technique? Testing exercise?

G. What are the merits of the recall type of test exercise?

H. Contrast the multiple-choice with true-false type of test exercise on four important points, bringing out the advantages and limitations.

I. What are the uses of the parts identification tests, and rearrangement exercises?

J. What are the advantages and disadvantages of the true-false exercise?

K. What are some of the ways in which the informational type of test question in Industrial Education may be validated?

L. How may reliability be secured for such test questions?

M. What are the common types of exercises used in informal tests?

N. How does a test performance differ from an informal test of knowledge?

O. How many items should be used in the informal achievement test?

P. What is meant by sampling? How is a "valid sampling" made?

Q. How may test items be arranged in the order of difficulty?
When should a further rearrangement of the questions be made?

R. What are some of the ways of securing objectivity in a test?

S. How is the problem of guessing in objective tests handled? Show, by example, how the correcting for chance formula is used.

T. What are some of the advantages and limitations of the essay type test? How can the scoring of such tests be made more objective?

U. In what ways can a test be improved as a result of use? What is meant by "item analysis"? How is "item analysis" used to improve tests?

V. What are the steps involved in constructing an informal objective test of information?

W. What standards would you apply to the evaluation of an informal objective test?

## UNIT IV

## EVALUATION OF SHOP AND LABORATORY PERFORMANCE

### I. Introduction

A. The level of accomplishment reached by students in the shop is generally set by the instructor. This level is largely determined by the way the instructor evaluates projects or jobs in process of completion and after completion. Evaluation may be given in the form of a subjective appraisal of the quality of workmanship, by a more careful application of the "tests of workmanship," or by the development of objective quality scales.

B. In answer to the needs for the objective measurement of performance in the shop, the project rating scale has been devised. It is coming into increasingly greater use for project appraisal, a possible solution to a very difficult problem of measurement for Industrial Education teachers.

C. The construction of a project, or the doing of a repair job, involves many operations. These operations must be well done if the completed project or job is to possess quality. In many cases, factors of design, planning, suitability of material, size, shape, etc., as well as quality of workmanship, have to be considered in evaluating the finished project. Quality scales are useful for the objective measurement of quality of work, and as teaching aids. Rate of work, identification and technique exercises are other important ways of evaluating performance.

### II. Objectives

A. General:

Provide the student with a clear understanding of the factors involved in project evaluation, together with techniques by means of which they may be measured.

B. Specific:

The learner will:

(1) Identify the common means of project evaluation
(2) Identify the scales for rating projects and jobs
(3) Construct a project rating scale
(4) Construct a quality scale
(5) Validate the reliability of quality scale ratings

### III. Assignment

A. Read the asterisked references first then others as you think time permits.
B. Construct a project rating scale for use in the shop area in which you are interested.
C. Be prepared to answer the questions pertaining to the unit.

## V. References

1. Wood, Dorothy Atkins, Test Construction, Charles H. Merill, Columbus, Ohio, 1961.

*2. Micheels, W. J., and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Co., Inc., New York, N. Y., Latest Edition.

## V. Study Questions

A. What factors involved in the construction of projects are most easily measured?

B. As a means of evaluation, what is the value of "tests of workmanship" given to the student in his job assignment?

C. How does the project rating scale differ from the quality scale?

D. What are the steps involved in preparing a quality rating scale?

E. Why should a wide range of sampling be used in constructing a test and especially a quality rating scale?

F. What are the three ways of rating shop projects?

G. How could the project rating scale be used to advantage for purposes other than measurement?

H. How objective would you regard the quality scale compared to other types of objective measurement?

I. What are the four kinds of performance exercises?

J. What steps are involved in constructing a project rating scale?

K. How could a project rating scale be used to advantage in teaching good workmanship? Consumer knowledge?

L. What instrument would be of most value to the drawing instructor in rating plates?

M. What is a sigma unit?

N. What is meant by standard deviation?

O. What is the reliability of a well-constructed quality scale?

P. In what ways may a quality scale be used for other than testing purposes?

Q. What is meant by "rating by inspection"?

## UNIT V

## STANDARDIZED TESTS IN INDUSTRIAL EDUCATION

### I. Introduction

A. The problems of high student failure rate, misapplication of abilities, misfits, high intelligence and low mechanical aptitude, low intelligence and high mechanical aptitude, lack of interest, poor attitude, high intelligence and high mechanical aptitude with low achievement, etc., are frequently confronted by teachers of shop courses. Ordinarily, such individual differences become fully known only after considerable time intervals and direct contact with students. If classes are large, knowledge of individual differences is likely to be especially scanty and incomplete. Accordingly, more rapid and accurate means of obtaining data on individual differences among students have been developed, and can be used to advantage by instructors.

B. The student is the raw material with which the teacher must work. The characteristics and potentialities of this material determines, to a large degree, what may be accomplished in an educational way with it. In the absence of knowledge of this material, the instructor is to some extent operating in the dark in carrying on the job of instruction.

C. From this point of view, the significance of tests of intelligence, aptitude, and traits of personality is apparent. Data from such tests enables the instructor to make adjustments in courses to fit individual needs and capacities, both with respect to content and method. Achievement may be compared to student capacity, and, with data from such tests, a more satisfactory job of educational and Vocational guidance may be accomplished.

D. Following the development of intelligence and aptitude tests, personality tests made their appearance. Instruments for the measurement of personality are usually classified under the headings of attitude, interest, and emotional adjustment. While these various tests of personality have been relatively late developments in the testing field, and represent an attempt to supplement other types of tests in the interest of a more complete profile of the individual, they admittedly deal with psychological factors very difficult to measure. In view of such difficulties, the progress of this phase of testing has been rather satisfactory.

E. Not a few of the teachers' problems are concerned with those students, who, due to one type of disturbance or maladjustment or another, fail to achieve levels of accomplishment of which they are capable. Personal instability, various complexes, matters of interest, social relationships, emotional disturbances, character traits, and certain attitudes and habits can be of as much significance in school success as factors of intelligence and aptitude. It is in the area plumbed by tests of personality that the incentives, wants, ambitions, interests, and other motivating forces and drives are to be found.

## II. Objectives

A. General:

The learner will develop an understanding of the motivating forces or drives of students.

B. Specific:

(1) The learner will gain a knowledge of individual differences in students.
(2) The student will learn how to use tests that have been devised to measure differences in intelligence, aptitude, preference, attitude, and emotional adjustment.
(3) The student will learn how to use commonly used tests of intelligence, aptitude, and personality in the field of Vocational-Industrial Education.
(4) The student will become aware of the problems on which test results have an important bearing.

## III. Assignment

A. Read the asterisked references first then others as you think time permits.
B. Make a list of the tests of aptitude that should be of interest to the teacher of Vocational-Industrial Subjects.
C. Be prepared to answer the questions pertaining to the unit.

## IV. References

1. Wood, Dorothy Atkins, Test Construction, Charles H. Merill, Columbus, Ohio, 1961.

*2. Micheels, W. J., and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Co., Inc., New York, N. Y., Latest Edition.

## V. Study Questions

A. Why should the shop teacher have a special interest in aptitude testing?

B. Of what importance are the results of general intelligence tests to the shop teacher?

C. What is the difference between the mental age and the I.Q.? What is the P.Q?

D. How could the shop teacher make use of mental test results in connection with achievement tests data?

E. What are some of the aptitude tests that are used by shop teachers?

F. Is there any significant correlation between intelligence and mechanical aptitude?

G. What would be the prognostic value of tests of mechanical aptitude?

H. How might the results of mental tests assist the instructor with his guidance duties?

I. What types of items are generally used as a basis for intelligence tests?

J. What are some of the definitions of intelligence?

K. Would a high intelligence test score indicate a high degree of mental ability?

L. What are the causes and symptoms of emotional maladjustment?

M. Why is student attitude of concern to the instructor? How may desirable attitudes be developed?

N. Name two attitude scales in use in the secondary school?

O. How do psychologists and laymen differ in their conceptions of the nature of personality?

P. What use is made of personal reports in the measurement of personality?

Q. What is the nature of interest, and of what value to the teacher is a knowledge of student interest?

R. Name two interest or preference tests that would be of value in the secondary school.

S. What are some of the methods by which student personal adjustment is measured?

T. What is meant by association methods of evaluating behavior?

U. Describe two major procedures used in the measurement of interest?

V. What data should go into the "profile" of the individual?

W. What is an individual inventory? A cumulative record? How are these used in a guidance program?

## UNIT VI

## SUMMARIZING, INTERPRETING, AND USING TEXT RESULTS

### I. Introduction

A. The development of a program of tests and measurements involves three distinct stages: (1) construction of the tests, giving consideration to validity, reliability, adequacy, objectivity, scorability, administrability, economy, etc.; (2) administration of the tests, involving such factors as the organization or divisions of the test, directions, conditions, time, scoring, etc.; and (3) summarizing, interpreting, and using the results, a phase that is concerned with classification, tabulation, norms, correlations, comparisons, grades, and other means of treatment and use of test data.

B. In this unit, we are concerned with the third and final aspect of testing. The summarization of test results includes the study of elementary statistical procedures, methods of tabulation or grouping, computation of the common measures of variability, the interrelations of measurable factors, derivation of standards, norms, and derived scores, and the use of graphic procedures. Interpretation has to do with the meaning of coefficients, norms, etc. Both summarization and interpretation bear directly upon the uses of test results. These uses have to do with grading, pupil adjustment, guidance, improvement of instruction, etc., as we noted in Unit II.

### II. Objectives

A. General:

The student will summarize and interpret test data.

B. Specific:

The student will:

(1) Prepare frequency tables
(2) Compute central tendency
(3) Measure variability
(4) Measure relationship
(5) Assign marks
(6) Develop norms

### III. Assignment

A. Read the asterisked references first then others as you think time permits.
B. Using the acutal test scores given you, make a frequency distribution, locate the mean, figure the standard deviation, assign grades, and evaluate the test.
C. Be prepared to answer the questions pertaining to the unit

## IV. References

1. Wood, Dorothy Atkins, Test Construction, Charles H. Merill, Columbus, Ohio, 1961.

*2. Micheels, W. J. and Karnes, M. Ray, Measuring Educational Achievement, McGraw-Hill Book Co., Inc., New York, N. Y., Latest Edition.

## V. Study Questions

A. What are the six uses of test results? What is their order of importance?

B. Arrange or rank these scores from a composite general shop test in the descending order: 43, 15, 18, 43, 20, 43, 26, 42, 29, 40, 29, 38, 36, 36, 20, 25, 32, 35, 32, 32, 32, 17, 45, 28, 39, 34, 44, 27, 31, 16, 24, 24.

(1) What is the highest score made on this test? The lowest score? The range of scores?
(2) If a frequency range of ten steps is selected, how many units will there be per step?
(3) What will be the limits of the class-intervals used?
(4) Tabulate these scores in a frequency distribution, choosing your own size of step and number of class-intervals. Choose steps with mid-points divisible by the size of the class-interval.

C. What is meant by frequency distribution? Range of scores? Class-interval?

D. What steps are involved in preparing a frequency table?

E. How is the measure of central tendency computed? What is the most commonly used method?

F. What is the difference between a mean and a median?

G. What steps are involved in computing the mean by the shorter method?

H. What is meant by measures of variability? How is standard deviation as a measure of variability computed?

I. How are grades assigned, using standard deviation data?

J. Explain the meaning of the coefficient of correlation: How is it found?

K. What are two practical uses of the correlation coefficient?

L. What is the meaning of a test score?

M. What is the meaning of the word "norm"? "Standard"?

N. What are some specific uses of norms?

O. In what ways may the marking system be objectified?

P. What is the advantage of letter grades over percentages?

Q. How are the methods of variance and item analysis, used to improve a test?

## CLASS EVALUATION

NAME OF COURSE ______________________________

DATE ____________________ INSTRUCTOR ____________________

1. Was the course basically what you expected? Yes ___ No ___
   If no, please explain. ______________________________

2. Would you eliminate any topics? Yes ___ No ___/ If yes, please explain. ______________________________

3. Would you add to the content? Yes ___ No ___. If yes, list the material you would like to add.

4. Do you feel that more or less time is required to adequately cover the subject: More ___ Less ___. Please explain your choice.

5. What parts should have more emphasis and what parts less?

6. Was the subject matter too detailed ___, too general ___, correct ___.

7. Was the pace fast ___, slow ___, suitable ___.

8. Was the level of presentation elementary ___, varied ___, advanced ___, right for you ___.

9. Were your questions welcomed? Yes ___ No ___. Answered satisfactorily? Yes ___ No ___. If not, explain.